The University of North Carolina at Chapel Hill

School of Medicine

STATEMENT ON EQUAL EDUCATIONAL OPPORTUNITY

The University of North Carolina at Chapel Hill is committed to equality of educational opportunity and does not discriminate against applicants, students, or employees based on race, color, national origin, religion, sex, age, or handicap. Any complaints alleging failure of this institution to follow this policy should be brought to the attention of the Assistant to the Chancellor. Moreover, The University of North Carolina at Chapel Hill is open to people of all races and actively seeks to promote racial integration by recruiting and enrolling a larger number of black students.

Published by THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL
Issued 16 times a year as follows: 1 in August,
2 in December, 3 in January, 2 in February, 3 in March,
3 in April, 1 in May, 1 in June
Send All Undeliverable Copies and Changes of Address to
Admissions Office, School of Medicine,
The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-7000

The catalog is published for the School by the Office of Academic Affairs: Linda Fisher-Neenan, editor. Cranine Brinkhous, UNC Printing Department, is catalog artist.

Although the publisher of this bulletin has made every reasonable effort to attain factual accuracy herein, no responsibility is assumed for editorial, clerical, or printing errors or error occasioned by mistakes. The publisher has attempted to present information which, at the time of preparation for printing, (March 1990) most accurately describes the course offerings, faculty listings, policies, procedures, regulations, and requirements of the University. However, it does not establish contractual relationships. The University reserves the right to alter or change any statement contained herein without prior notice.

2,000 copies of this public document were printed at a cost of $17,789.00, $8.90 per copy.

C378
U131

March 1990 *Number 1017*

RECORD OF
THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

CATALOG OF THE
SCHOOL OF MEDICINE
1987–88, 1988–89, 1989–90

THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL
CHAPEL HILL, NC 27599

*Academic Calendar** †

1987–1988

FIRST YEAR		SECOND YEAR
August 17	*Registration*	August 14
August 19	*First day of classes*	August 17
September 7	*Holiday, Labor Day*	September 7
October 16, 5 p.m.	*Fall recess begins*	October 16, 5 p.m.
October 21, 8 a.m.	*Instruction resumes*	October 21, 8 a.m.
November 25, 1 p.m.	*Thanksgiving recess begins*	November 25, 1 p.m.
November 30, 8 a.m.	*Instruction resumes*	November 30, 8 a.m.
December 18, 5 p.m.	*Christmas recess begins*	December 18, 5 p.m.
January 4, 8 a.m.	*Instruction resumes*	January 4, 8 a.m.
January 18	*Holiday, Martin Luther King Day*	January 18
March 4, 5 p.m.	*Spring recess begins*	March 4, 5 p.m.
March 14, 8 a.m.	*Instruction resumes*	March 14, 8 a.m.
April 4	*Holiday, Good Friday*	April 4
May 3	*Last Day of Classes*	April 8
May 4–10	*Reading period and Examinations*	April 11–20
	Transition Course	April 22–27

*Subject to change
†Daily schedules available at fall registration

THIRD AND FOURTH YEARS

NOTE: Students in third and fourth years are scheduled on a rotational basis.

CLERKSHIPS

Medicine and Surgery

June 1–August 21
August 31–November 20
November 30–March 4
March 7–May 27

OB-Gyn., Pediatrics, Psychiatry

June 1–July 10
July 20–August 28
August 31–October 9
October 12–November 20
November 30–January 22
January 25–March 4
March 7–April 15
April 18–May 27

Independence Day, July 4
Labor Day, September 7
Thanksgiving Holiday, November 21–29
Christmas Holiday, December 21–January 3
Martin Luther King Holiday, January 18
Good Friday, April 1

Examinations: To be arranged

ELECTIVE PERIODS

Summer Session

0. May 4–May 31
1. June 8–July 5
2. July 6–August 2
3. August 3–August 30

Fall Semester

4. August 31–September 27
5. September 28–October 25
6. October 26–November 22
7. November 23–December 20

Spring Semester

8. January 4–January 31
9. February 1–February 28
10. February 29–March 27
11. March 28– April 24

Commencement: May 8, 1988

Academic Calendar †*

1988–1989

FIRST YEAR		SECOND YEAR
August 15	*Registration*	August 15
August 17	*First day of classes*	August 15
September 5	*Holiday, Labor Day*	September 5
October 6, 5 p.m.	*Fall recess begins*	October 6, 5 p.m.
October 11, 8 a.m.	*Instruction resumes*	October 11, 8 a.m.
November 23, 1 p.m.	*Thanksgiving recess begins*	November 23, 1 p.m.
November 28, 8 a.m.	*Instruction resumes*	November 28, 8 a.m.
December 16, 5 p.m.	*Christmas recess begins*	December 16, 5 p.m.
January 9, 8 a.m.	*Instruction resumes*	January 9, 8 a.m.
January 16	*Holiday, Martin Luther King Day*	January 16
March 10, 5 p.m.	*Spring recess begins*	March 10, 5 p.m.
March 20, 8 a.m.	*Instruction resumes*	March 20, 8 a.m.
March 24	*Holiday, Good Friday*	March 24
May 9	*Last Day of Classes*	April 17
May 10–16	*Reading period and Examinations*	April 18–26
	Transition Course	May 1–5

*Subject to change
†Daily schedules available at fall registration

THIRD AND FOURTH YEARS

NOTE: Students in third and fourth years are scheduled on a rotational basis.

CLERKSHIPS

Medicine and Surgery

May 31–August 19
August 29–November 18
November 28–March 3
March 6–May 26

OB-Gyn., Pediatrics, Psychiatry

May 31–July 8
July 18–August 26
August 29–October 7
October 10–November 18
November 28–January 20
January 23–March 3
March 6–April 14
April 17–May 26

Independence Day, July 4
Labor Day, September 5
Thanksgiving Holiday, November 19–27
Christmas Holiday, December 19–January 2
Martin Luther King Holiday, January 16
Good Friday, March 24

Examinations: To be arranged

ELECTIVE PERIODS

Summer Session

0. May 2–May 29
1. June 6–July 3
2. July 5–July 31
3. August 1–August 28

Fall Semester

4. August 29–September 25
5. September 26–October 23
6. October 24–November 20
7. November 21–December 18

Spring Semester

8. January 2–January 29
9. January 30–February 26
10. February 27–March 23
11. March 27–April 23

Commencement: May 14, 1989

Academic Calendar †*

1989–1990

FIRST YEAR		SECOND YEAR
August 21	*Registration*	August 21
August 22	*First day of classes*	August 21
September 4	*Holiday, Labor Day*	September 4
October 20, 5 p.m.	*Fall recess begins*	October 20, 5 p.m.
October 25, 8 a.m.	*Instruction resumes*	October 25, 8 a.m.
November 22, 1 p.m.	*Thanksgiving recess begins*	November 22, 1 p.m.
November 27, 8 a.m.	*Instruction resumes*	November 27, 8 a.m.
December 21, 5 p.m.	*Christmas recess begins*	December 21, 5 p.m.
January 8, 8 a.m.	*Instruction resumes*	January 8, 8 a.m.
January 15	*Holiday, Martin Luther King Day*	January 15
March 9, 5 p.m.	*Spring recess begins*	March 9, 5 p.m.
March 19, 8 a.m.	*Instruction resumes*	March 19, 8 a.m.
April 13	*Holiday, Good Friday*	April 13
May 8	*Last Day of Classes*	April 17
May 9–18	*Reading period and Examinations*	April 18–27
	Transition Course	April 30–May 4

*Subject to change
†Daily schedules available at fall registration

THIRD AND FOURTH YEARS

NOTE: Students in third and fourth years are scheduled on a rotational basis.

CLERKSHIPS

Medicine and Surgery

May 30–August 18
August 28–November 17
November 27–March 2
March 5–May 25

OB-Gyn., Pediatrics, Psychiatry

May 30–July 7
July 17–August 25
August 28–October 6
October 9–November 17
November 27–January 19
January 22–March 2
March 5–April 12
April 16–May 25

Independence Day, July 4
Labor Day, September 4
Thanksgiving Holiday, November 18–26
Christmas Holiday, December 18–January 1
Martin Luther King Holiday, January 15
Good Friday, April 13

Examinations: To be arranged

ELECTIVE PERIODS

Summer Session

0. May 1–May 28
1. June 5–July 2
2. July 3–July 30
3. July 31–August 27

Fall Semester

4. August 28–September 24
5. September 25–October 22
6. October 23–November 19
7. November 20–December 17

Spring Semester

8. January 2–January 28
9. January 29–February 25
10. February 26–March 25
11. March 26–April 22

Commencement: May 13, 1990

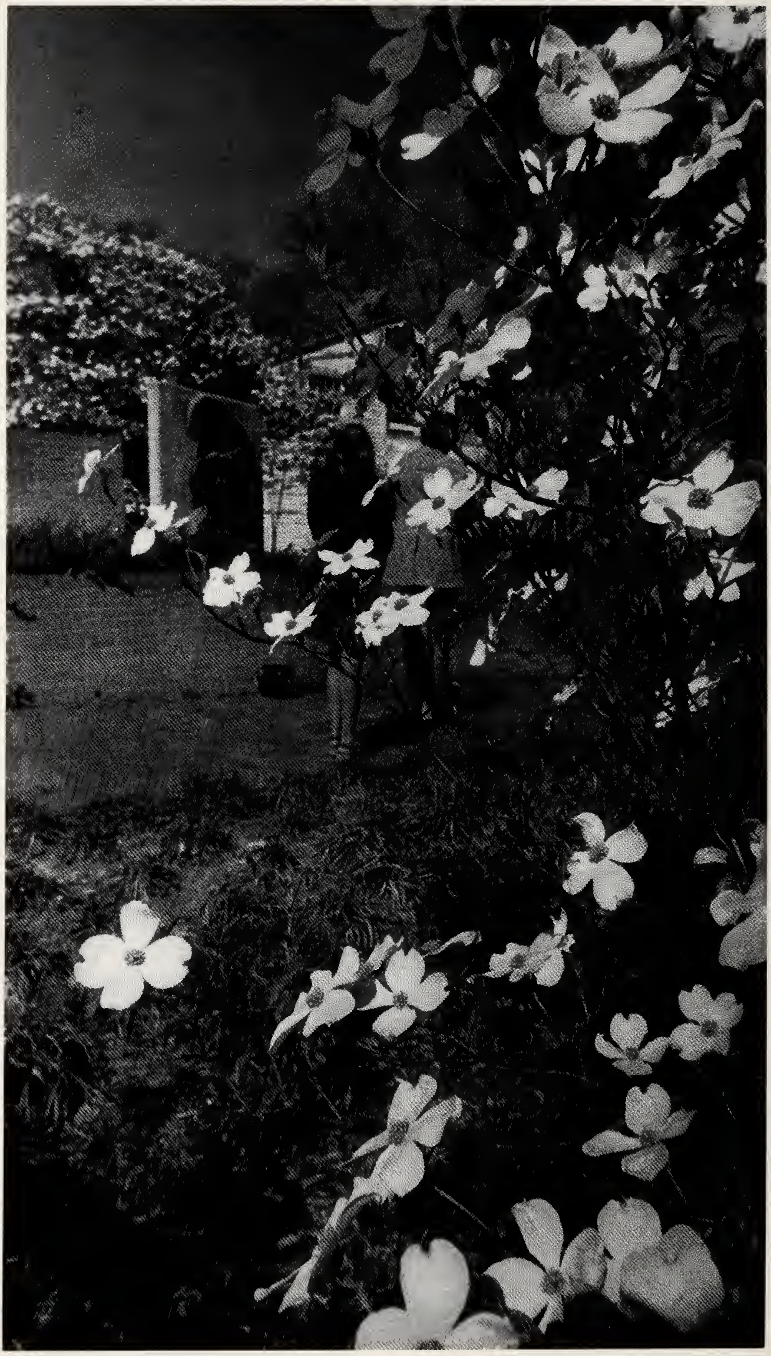


Table of Contents

A Letter from the Dean / 1

A Policy Statement of the Faculty / 3

Mission Statement / 5

General Information
  Officers of Administration / 7
  History of the Medical School / 11
  University of North Carolina Hospitals / 17
  Area Health Education Centers / 21
  Physical Facilities / 25
  Health Sciences Library / 29

Admissions / 31

Combined Degree Programs / 37

Financial Information /41

Student-Faculty Relations / 53

Associations / 54

The Academic Program
  Medical Curriculum / 63
  Research and Academic Enrichment / 64
  Requirements for Degrees in Medicine / 66
  Evaluation of Student Performance / 68
  Description of Curricula and List of Courses For All Four Years / 71

Faculty and Graduate School Curriculum, by Department / 129

Interdisciplinary Programs / 212

Centers, Divisions and Offices / 231

Honors and Awards / 247

Student Roster / 269

Appendices / 300
  A. General University: Mission Statement, History, and Regulations and Policies
  B. Educational Policies of the School of Medicine

A catalog is necessarily like a portrait. It is unavoidably incomplete, and it can reflect accurately only a brief interval of time because the programs it describes are in a state of continuing evolution. This catalog presents many aspects of the academic and student life of the School of Medicine. It cannot convey the principles, goals, dedication and humaneness of the people, both faculty and students, who comprise this school. Our broad purpose is to provide an educational basis for a lifetime of learning and service in a health profession and to offer, primarily to young men and women of North Carolina, access to excellence in contemporary medical education. Our graduates regularly enter the most attractive residency programs in the state and nation and distinguish themselves in careers in general and specialty medical practice of all kinds, in biomedical and behavioral research, in teaching and in the administration of health care. Our purpose is also to be a principal source of physicians of the highest competence and most appropriate abilities for the people of North Carolina.

Our educational programs are based both in the major academic health center at The University of North Carolina at Chapel Hill and in six Area Health Education Centers located in communities across the state. In Chapel Hill, the School of Medicine is associated with outstanding schools of Public Health, Dentistry, Nursing and Pharmacy and with the 650-bed University of North Carolina Hospitals. Here our students can become involved in the work of advanced science, in both complex and basic patient care, in the development and early application of high technology and in the formal study of social and administrative medicine and ethics. In the Area Health Education Centers, full-time faculty and practicing physicians assure that our students also receive a strong educational experience in the rural and suburban communities, the setting in which most physicians and other health professionals will work. Our programs in Family Medicine, General Internal Medicine and General Pediatrics provide strong experience in primary care.

Our curriculum is carefully designed to assure a series of balances: balance between the size of the information base and the learning capacity of the students; balance between theory and practice; balance between professional education and training; balance between biomedical science content and an understanding of man as a social, cultural, and religious being; balance between emphases on prevention, cure and adaptation; balance between care of the individual and care of the community; and balance between scientific understanding and empiricism.

The School of Medicine is especially proud of its record of admission and graduation of black and American Indian minorities, and it actively seeks to promote student diversity by enrolling minority applicants.

The incorporation of the very best of biological, behavioral and social sciences appropriately into the acts of humane, effective and cost-conscious medical care is a great and continuing challenge. We welcome the interest of prospective students and the commitment and industry of those who join us.

Stuart Bondurant, M.D.
Dean

A Policy Statement of the Faculty

As a state university, we have a special opportunity and challenge for leadership and service in meeting the health needs of the state through programs of excellence in teaching, research and patient care. One of our goals is to educate the best physicians for the needs of the state. To achieve this, our graduates will include all types of physicians, and many will achieve distinction nationally and internationally, as well as within the state.

The Admissions Committee will give preference to properly qualified residents of North Carolina, and we will also encourage applications for admission from properly qualified nonresidents in order to assure appropriate scope and diversity of the student body.

Some medical schools emphasize the development of practitioners; others emphasize the training of academically oriented physicians. We believe the best education, no matter what future course the student follows, is provided by having a faculty and student body with breadth and a variety of interests, attitudes, and goals. In this school we develop both those who will deliver primary care and specialized care, as well as those who will be the next generation of educators and investigators.

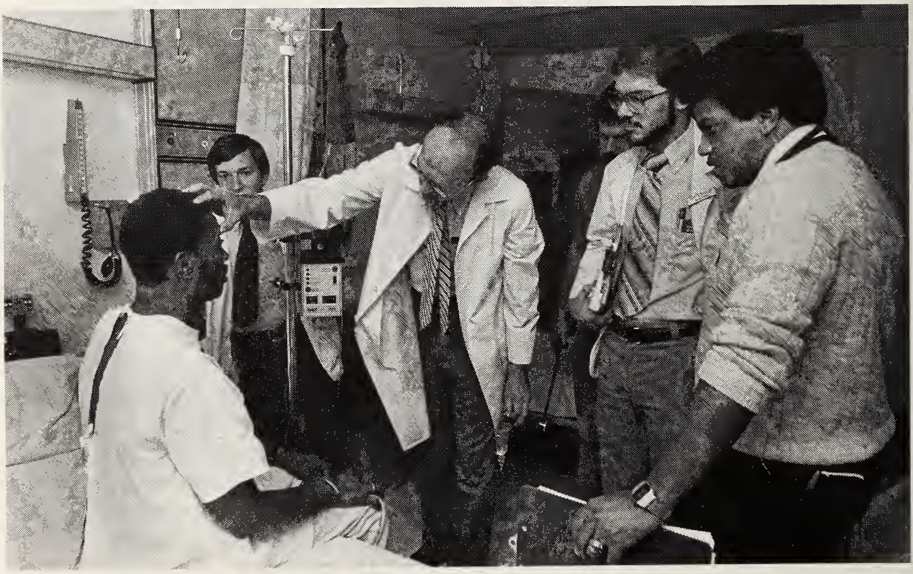
We believe that medical students should get a broad training in all major aspects of medical science, practice, and the role of the physician in society. However, because of the ever-increasing complexity of medicine, it seems reasonable to make it possible for some students to make an early career decision and adjust their education accordingly. We present a flexible educational program so that, insofar as possible, students may pace their rates of progress and pursue areas of special interest in depth.

The faculty will assume some responsibility for matters which influence professional performance above and beyond actual course content. These matters include maturation of the student as a unique individual, scholarly stimulation, development of the sense of professional identity and responsibility, and a humanitarian attitude. In addition, we will foster an attitude of desire for continuing acquisition of new knowledge as it develops in the medical sciences. The degree of faculty responsibility in these matters and the techniques for exercising responsibility in these matters are issues of continuing study and formulation by the faculty.

We provide an extensive array of opportunities for academic enrichment beyond the regular curriculum in all major areas of biomedical and clinical science and through the University and the other health sciences schools in the entire span of knowledge related to health. We encourage students to seek both depth and scope of academic experience beyond the minimum. We encourage some medical students not only to obtain the M.D. degree, but also to obtain concurrently sufficient basic science work and qualify for a Ph.D. Also, we support strong educational programs for Ph.D. candidates in medically related sciences.

We intend to give leadership in determining the course of medical education, not only during the traditional four years of the medical school curriculum, but also from the time of completion of secondary school until the time of actually starting careers.

We provide leadership in continuing education throughout the physician's entire career. The fact that the majority of our graduates practice in this and neighboring states facilitates our task in this regard and provides us with a special challenge and opportunity.



Mission Statement

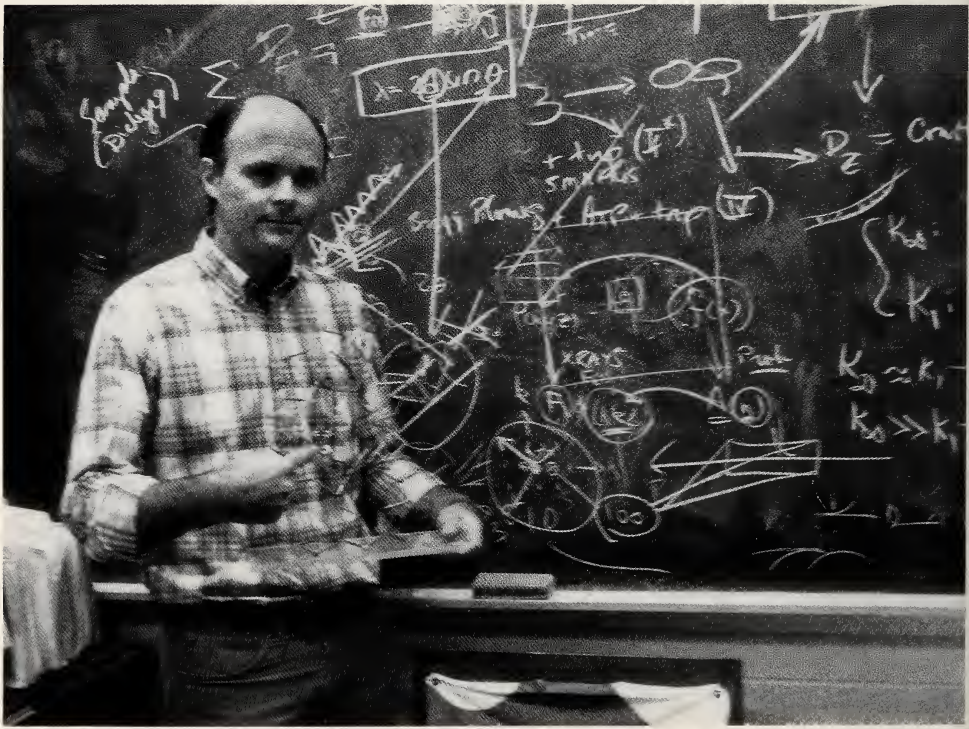
SCHOOL OF MEDICINE
UNIVERSITY OF NORTH CAROLINA
AT CHAPEL HILL

The School of Medicine of The University of North Carolina at Chapel Hill exists to educate students and professionals of the health and biomedical sciences, to conduct scholarly investigation in biomedical, behavioral and social sciences, and to render service to the people and institutions of the state, the region, the nation, and as appropriate, throughout the world. This mission has evolved with the growth of knowledge in these areas and with the demands the people of the state have placed upon the institution.

In its instructional role, the School is committed to educational programs ranging from the study of molecules to the societal aspects of health maintenance. The School provides a wide range of curricula for the continuing training of beginning and established health science professionals. The School is committed to excellence in all of these programs and to their adaptation to meet the changes that will occur with the growth of knowledge and experience.

As part of the University community, the School is committed to maintaining a position of leadership in the study of the physical, biological, behavioral and social sciences as they relate to human life and disease. As a place of active research and scholarship in the biomedical fields, it has an obligation and responsibility to provide new knowledge to the state and the nation.

With educational and scholarly programs focused upon human health and disease, the School provides health care and consultative services that focus on the individual and on the community. The service commitment of the School is directed principally at people in communities of North Carolina. However, in its service function as in its other programs, the School of Medicine desires to cooperate with other schools, other institutions and other agencies of the State of North Carolina and the nation.


XRAYS
$K_0 \approx k_1$
$K_0 \gg k_1$

Officers of Administration

The University of North Carolina at Chapel Hill

PAUL HARDIN, J.D., *Chancellor*

- SUSAN H. EHRINGHAUS, J.D., *Assistant to the Chancellor and Senior University Counsel*
- DOUGLASS HUNT, LL.B., Special *Assistant to the Chancellor*
- DAVID D. DILL, Ph.D., *Assistant to the Chancellor for Planning*
- ROBERT J. CANNON, Ph.D., *Affirmative Action Officer*
- BRENDA W. KIRBY, *Secretary to the University*

DONALD A. BOULTON, Ed.D., *Vice-Chancellor and Dean of Student Affairs*

GARY A. EVANS, B.A., *Vice-Chancellor for Development and University Relations*

H. GARLAND HERSHEY, JR., D.D.S., *Vice-Chancellor for Health Affairs and Vice Provost*

J. DENNIS O'CONNOR, Ph.D., *Provost and Vice-Chancellor for Academic Affairs*

JOHN D. SWOFFORD, M.Ed., *Director of Athletics*

BEN J. TUCHI, Ph.D., *Vice-Chancellor for Business and Finance*

HAROLD G. WALLACE, M.Div., *Vice-Chancellor for University Affairs*

The School of Medicine

STUART BONDURANT, B.S., M.D., *Dean*

CHRISTOPHER C. FORDHAM III, M.D., *Dean Emeritus*

ISAAC M. TAYLOR, B.A., M.D., *Dean Emeritus*

KIRK C. AUNE, B.Chem., Ph.D., *Associate Dean for Information Systems*

WILLIAM E. BAKEWELL, JR., B.A., M.A., M.D., C.M., *Associate Dean for Admissions*

WILLIAM E. EASTERLING, JR., A.B., M.D., *Associate Dean for Continuing Medical Education and Alumni Affairs*

ROBERT C. CEFALO, A.B., M.D., Ph.D., *Assistant Dean for Graduate Medical Education*

CHARLES P. FRIEDMAN, B.S., M.S., Ph.D., *Director of Office of Educational Development*

DON A. GABRIEL, B.S., M.D., Ph.D., *Assistant Dean and Associate Chief of Staff for Inpatient Care, University of North Carolina Hospitals*

MARY JANE GRAY, B.A., D.Med.Sci., *Assistant Dean for Student Affairs*

LUCIA W. HUDSON, *Administrative Assistant to the Dean*

WILLIAM D. HUFFINES, B.S., M.D., *Associate Dean for Basic Sciences and Medical Allied Health Professions*

GEORGE JOHNSON, JR., B.S., M.D., *Special Assistant to the Dean*

JUDITH E. LEONARD, B.S., M.Ed., J.D., *Assistant to the Dean and Assistant Director for Legal Affairs, North Carolina Area Health Education Centers (AHEC) Program*

STANLEY R. MANDEL, B.A., M.S., M.D., *Associate Dean and Chief of Staff, University of North Carolina Hospitals*

WILLIAM D. MATTERN, B.A., M.D., *Associate Dean for Academic Affairs*

EUGENE S. MAYER, B.S., M.P.H., M.D., *Associate Dean and Director, North Carolina Area Health Education Centers (AHEC)*

CHERYL F. MCCARTNEY, B.S., M.D., *Associate Dean for Student Affairs*

CONNIE M. MCMANUS, *Registrar*

ERIC B. MUNSON, B.A., M.B.A., *Assistant Dean for Hospital Affairs and Executive Director, University of North Carolina Hospitals*

EVERETT R. NORDSTROM, B.B.A., *Executive Director of the Medical Foundation*

DAVID R. PERRY, A.B., M.A., *Associate Dean For Administration*

TODD L. PETERSON, B.S., M.A., *Assistant Dean and Director of Operations, University of North Carolina Hospitals*

MARION PHILLIPS, B.A., M.Th., D.Mn., *Associate Dean*

JOHN W. STOKES, B.S., *Director, Office of Institutional Relations*

GREGORY STRAYHORN, B.A., M.D., M.P.H., Ph.D., *Assistant Dean for Academic Affairs*

JAMES G. VAUGHN, B.S., C.P.A., *Assistant Dean for Fiscal Affairs*

RAYMOND P. WHITE, JR., D.D.S., Ph.D., *Associate Dean and Associate Chief of Staff for Ambulatory Care, University of North Carolina Hospitals*

WILLIAM B. WOOD, B.S., M.D., *Associate Dean*

Administrative Board of the School of Medicine

STUART BONDURANT, B.S., M.D., *(Chair), Professor of Medicine and Dean of the School of Medicine*

THOMAS F. BOAT, B.A., M.S., M.D., *Chair and Professor of Pediatrics*

ROBERT A. BRIGGAMAN, B.S., M.D., *Chair and Professor of Dermatology*

MARY C. DOWE, B.S.N., R.N., Ed.D., *Associate Professor of Nursing*

JOE W. GRISHAM, B.A., M.D., *Chair and Professor of Pathology*

PHILIP F. GURA, B.A., Ph.D., *Professor of English and American Studies*

CHARLES R. HACKENBROCK, B.S., Ph.D., *Chair and Professor of Cell Biology and Anatomy*

H. GARLAND HERSHEY, Jr., B.A., D.D.S., M.S., *Professor of Orthodontics and Vice Chancellor for Health Affairs, ex-officio*

RUDOLPH L. JULIANO, B.S., Ph.D., *Chair and Professor of Pharmacology*

JOHN C. LUCCHESI, B.A., M.S., Ph.D., *Cary C. Boshamer Professor of Biology*

GARY R. MATZKE, Pharm.D., *Professor and Vice Chairman for the Division of Pharmacy Practice*

JAMES H. SCATLIFF, B.S., M.D., *Chair and Professor of Radiology*

J. RICHARD SEED, A.B., Ph.D., *Chair and Professor of Parasitology and Laboratory Practice*

TIMOTHY A. TURVEY, D.D.S., *Professor of Oral and Maxillofacial Surgery*

ROBERT W. VAUGHAN, B.S., M.D., *Chair and Professor of Anesthesiology*

EDITH E. WIGGINS, M.S.W., *Assistant Vice Chancellor and Associate Dean for Student Affairs*

DAVID E. YODER, B.A., M.A., Ph.D., *Chair and Professor of Medical Allied Health Professions*

The Advisory Committee of the Medical Faculty

STUART BONDURANT, B.S., M.D., *Chair; Dean and Professor of Medicine*

THOMAS F. BOAT, B.A., M.S., M.D., *Chair and Professor of Pediatrics*

ROBERT A. BRIGGAMAN, B.S., M.D., *Chair and Professor of Dermatology*

LARRY R. CHURCHILL, B.A., M.Div., Ph.D., *Acting Chair and Professor of Social Medicine*

MICHAEL G. DOUGLAS, B.Sc., Ph.D., *Chair and Professor of Biochemistry and Nutrition*

WILLIAM DROEGEMUELLER, B.A., M.D., *Chair and Robert A. Ross Distinguished Professor of Obstetrics and Gynecology*

DAVID E. EIFRIG, B.A., M.D., *Chair and Dr. and Mrs. Sterling A. Barrett Professor of Ophthalmology*

HARRY GOODER, B.Sc., Ph.D., *Acting Chair and Professor of Microbiology and Immunology*

CARL W. GOTTSCHALK, B.S., M.D., Sc.D., *Acting Chair of Physiology and Kenan Professor of Medicine and Physiology*

JOE W. GRISHAM, B.A., M.D., *Chair and Professor of Pathology*

CHARLES R. HACKENBROCK, B.S., Ph.D., *Chair and Professor of Cell Biology and Anatomy*

JAMES N. HAYWARD, B.S., M.D., *Chair and H. Houston Merritt Distinguished Professor of Neurology*

DAVID S. JANOWSKY, B.S., M.D., *Chair and Professor of Psychiatry*

RUDOLPH L. JULIANO, B.S., Ph.D., *Chair and Professor of Pharmacology*

ERIC B. MUNSON, B.A., M.B.A., *Assistant Dean for Hospital Affairs and Executive Director, University of North Carolina Hospitals*

KENNETH G. REEB, B.S., M.D., *Chair and Professor of Family Medicine*

JAMES H. SCATLIFF, B.S., M.D., *Chair and Professor of Radiology*

GEORGE F. SHELDON, B.A., M.D., *Chair and Zack D. Owens Distinguished Professor of Surgery*

P. FREDERICK SPARLING, A.B., M.D., *Chair of Medicine and J. Herbert Bate Professor of Medicine and Microbiology and Immunology*

JOEL E. TEPPER, B.S., M.D., *Chair and Professor of Radiation Oncology*

ROBERT W. VAUGHAN, B.S., M.D., *Chair and Professor of Anesthesiology*

DAVID E. YODER, B.A., M.A., Ph.D., *Chair and Professor of Medical Allied Health Professions*

EX-OFFICIO MEMBERS

TERESA T. ANDERSON, MSIV, *President, Whitehead Society*

KIRK C. AUNE, B.Chem., Ph.D., *Associate Dean for Information Systems*

WILLIAM E. BAKEWELL, Jr., B.A., M.A., M.D., C.M., *Associate Dean for Admissions*

PHILIP A. BROMBERG, B.S., M.D., *Director, Center for Environmental Medicine and Lung Biology*

PHILIP L. CARL, Ph.D., *Acting Director, Program on Molecular Biology and Biotechnology*

ROBERT C. CEFALO, A.B., M.D., Ph.D., *Assistant Dean for Graduate Medical Education*

WILLIAM E. EASTERLING, JR., A.B., M.D., *Associate Dean for Continuing Medical Education and Alumni Affairs*

CHARLES P. FRIEDMAN, B.S., M.S., Ph.D., *Director, Office of Educational Development*

DON A. GABRIEL, B.S., M.D., Ph.D., *Assistant Dean and Associate Chief of Staff for Inpatient Care, University of North Carolina Hospitals*

MARY JANE GRAY, B.A., M.D., *Assistant Dean for Student Affairs*

WILLIAM D. HUFFINES, B.S., M.D., *Associate Dean for Basic Sciences and Medical Allied Health Professions*

GEORGE JOHNSON, Jr., B.S., M.D., *Special Assistant to the Dean*

JUDITH E. LEONARD, B.S., M.Ed., J.D., *Assistant to the Dean and Assistant Director for Legal Affairs, North Carolina Area Health Education Centers Program*

MELVIN D. LEVINE, A.B., M.D., *Director, Clinical Center for the Study of Development and Learning*

CAROL N. LUCAS, B.A., M.S., Ph.D., *Acting Director, Curriculum in Biomedical Engineering and Mathematics*

STANLEY R. MANDEL, B.A., M.S., M.D., *Associate Dean and Chief of Staff, The University of North Carolina Hospitals*

WILLIAM D. MATTERN, B.A., M.D., *Associate Dean for Academic Affairs*

EUGENE S. MAYER, B.S., M.P.H., M.D., *Associate Dean, Director, North Carolina Area Health Education Centers Program*

CHERYL F. MCCARTNEY, B.S., M.D., *Associate Dean for Student Affairs*

WILLIAM W. MCLENDON, B.A., M.D., *Director, Division of Laboratory Medicine and Chairman, Department of Hospital Laboratories, University of North Carolina Hospitals*

GERRY S. OXFORD, B.A., Ph.D., *Director, Curriculum in Neurobiology*

JOSEPH S. PAGANO, A.B., M.D., *Director, Lineberger Cancer Research Center*

DAVID R. PERRY, A.B., M.A., *Associate Dean for Administration*

MARION PHILLIPS, A.B., M.Th., D.Mn., *Associate Dean*

DON M. POWELL, B.S., M.D., *Director, Program in Digestive Diseases and Nutrition*

HAROLD R. ROBERTS, B.S., M.D., *Director, Center for Thrombosis and Hemostasis*

JOHN W. STOKES, B.S., *Director, The Office of Institutional Relations*

GREGORY STRAYHORN, B.A., M.D., M.P.H., Ph.D., *Assistant Dean for Academic Affairs*

KUNIHIKO SUZUKI, A.B., M.D., *Director, Biological Sciences Research Center*

JAMES G. VAUGHN, B.S., C.P.A., *Assistant Dean for Fiscal Affairs*

RAYMOND P. WHITE, Jr., D.D.S., Ph.D., *Associate Dean and Associate Chief of Staff for Ambulatory Care, University of North Carolina Hospitals*

JOHN B. WINFIELD, B.A., M.D., *Director, Multipurpose Arthritis Center*

WILLIAM B. WOOD, B.S., M.D., *Associate Dean*

History of the Medical School

There is evidence that medical instruction was given in Chapel Hill before the Civil War but the connection of this undertaking to the University is not clear. The first university-sponsored School of Medicine was established in 1879. Dr. Thomas W. Harris, an honor graduate of the class of 1859 at the University of North Carolina, was Dean and Professor of Anatomy. His only faculty colleagues were Professor A. Fletcher Redd in chemistry and Professor Frederic W. Simonds in botany and physiology. Courses in anatomy formed the basis of the two-year curriculum. Dr. Harris also was able to introduce students to clinical medicine and surgery through the free clinics he established in the community. Dr. Harris received no salary from the University and therefore maintained a large medical practice. The burden of his practice and his teaching responsibilities became too great. When he resigned in 1885 to devote his time to the practice of medicine in the growing town of Durham, 37 students had attended the School of Medicine.

The School was reopened in 1890 with Dr. Richard H. Whitehead as Dean and Professor of Anatomy. His ability as a scientist and teacher established the academic reputation of the School during the following 15 years, a reputation that has persisted through succeeding generations of faculty.

In 1902 University President Francis P. Venable, Dr. Whitehead, and Dr. Hubert A. Royster, Sr. of Raleigh established the University Medical Department at Raleigh. Dr. Royster was appointed Dean and Professor of Gynecology. Despite the inability of the State of North Carolina and the University to adequately finance this expanded operation, the leading physicians in Raleigh, many of whom were already on the faculty of the Leonard Medical College of Shaw University, provided clinical instruction for junior and senior students in the Rex, St. Agnes, and Dorothea Dix Hospitals and the Raleigh Dispensary. In 1910 the Carnegie Foundation for the Advancement of Teaching published the Flexner Report, which recommended standards for medical schools. Because the University could not afford to upgrade both the preclinical and clinical programs to meet recommendations in the report, the department in Raleigh was closed.

Dr. Isaac Hall Manning, the first professor of physiology and biological chemistry, succeeded Dr. Whitehead as dean in 1905. A member of the medical class of 1895, he and a few able colleagues strengthened the basic science departments and improved the preclinical science teaching programs. The reputation of the School continued to grow, and increasing numbers of students were accepted for transfer to the junior class of leading medical schools in the East, South, and Midwest. Many of these students returned to practice in North Carolina. At the time of the Medical School's expansion to a four-year program in 1954, approximately 25% of the physicians practicing in North Carolina had attended the state's two-year medical school.

Caldwell Hall, the first university building planned for medical instruction with adequate laboratories, classrooms, and library space, was completed in 1912. Here the School of Medicine functioned until 1938, when it was moved to MacNider Hall, a new, enlarged basic science building.

In 1923 and again in 1937, state commissions were appointed to study the advisability of expanding the School's program to four years. The University, the medical alumni, and many leading citizens of the state actively supported these efforts. However, lack of funds and controversy over the location of the expanded school foiled these early attempts; Duke University and Wake Forest College subsequently established four-year programs.

Dr. Walter Reece Berryhill became Dean of the School in 1941. His energy, wisdom and foresight, coupled with the support of his able faculty colleagues, ushered in an era of progress for medical education in North Carolina.

In 1947 the North Carolina General Assembly appropriated funds for constructing the 400-bed North Carolina Memorial Hospital, for a modest enlargement of the medical science building, and for educational and dormitory facilities for a school of nursing. This brought to a successful conclusion the statewide effort proposed by Governor J. Melville Broughton in 1944 to improve the health care of North Carolina through state (and subsequently federal) financial aid for constructing needed hospitals and health centers, increasing medical and health manpower, and expanding the UNC School of Medicine's program to four years.

The North Carolina Memorial Hospital (renamed in 1989 as the University of North Carolina Hospitals) opened in 1952, and the 48 members of the first class in the newly expanded program of the Medical School received the M.D. degree in 1954. An exceptionally able group of clinical department chairmen and faculty whom they had recruited, together with strengthened basic science departments, established the School on a firm basis. The first chairmen of the clinical departments were Dr. Kenneth Brinkhous in Pathology, Dr. Charles H. Burnett in Medicine, Dr. Edward Curnen in Pediatrics, Dr. George Ham in Psychiatry, Dr. Robert A. Ross in Obstetrics and Gynecology, Dr. Nathan A. Womack in Surgery, and Dr. Ernest Wood in Radiology.

In 1964 Dr. Berryhill retired from the deanship and began the development of community clinical education programs. He was succeeded by Dr. Isaac M. Taylor, who led many important changes. Faculty committees carefully reevaluated the Medical School curriculum in light of many of the changes that had occurred in medical education and in the complex roles physicians were required to fulfill. A new, interdisciplinary and more flexible curriculum, together with a pass-fail, end-of-year examination system, was instituted in 1967. The Morehead Fellowship Program in medicine was also started. In 1973 graduates of the School scored second among all schools on Part II of the National Board of Medical Examiners examination. During the late 1960s plans were developed for expanding the physical plant available to the faculty and staff of the medical school and hospital, and funds were obtained through a combination of state, federal, and private sources for implementation of these plans. Projects that resulted from these efforts included Berryhill Hall (basic medical sciences teaching facility), the Brinkhous-Bullitt Building (preclinical education building), the Burnett-Womack Building (clinical science building), and the Bed Tower and the Spencer Love Clinics in the North Carolina Memorial Hospital.

In mid-1971 the General Assembly approved legislation creating a Board of Directors for the North Carolina Memorial Hospital and separating it organizationally from the administration of The University of North Carolina at Chapel Hill. Dr. Taylor remained as Dean until June 30, 1971. He was succeeded September 1, 1971 by Dr. Christopher C. Fordham III.

During the past decade and a half many important changes have occurred in the academic medical center in Chapel Hill. There has continued to be substantial growth in the educational programs. The size of the medical student body has increased from approximately 340 students in the 1970-71 year to 640 students in the 1987–88 year. The faculty has increased in size to approximately 650 full-time members, including many promising and distinguished scholars and physicians in the faculty at junior and senior levels. There has been significant growth in the graduate education programs for the training of both basic scientists and clinical specialists, and in the medical allied health area.

Relationships between the Medical School and the North Carolina Memorial Hospital have been strong and collegial, and much progress has been made in the organizational patient care effort. Mr. John Danielson became the first General Director of the North Carolina Memorial Hospital, appointed by the Board of Directors in early 1972; he was succeeded by Mr. Dennis Barry in January 1975. Mr. Barry resigned in 1979, and in 1980 Mr. Eric Munson became the hospital's chief executive officer when he was named Executive Director. The leadership provided by Danielson, Barry, and Munson has enabled the medical staff, headed until 1989 by Dr. William Easterling, to participate in an increasingly effective way with the hospital administration in seeking the highest quality patient care possible. A good working relationship between the hospital and medical school has developed which enhances the hospital as a learning environment while maintaining the highest standards for patient care.

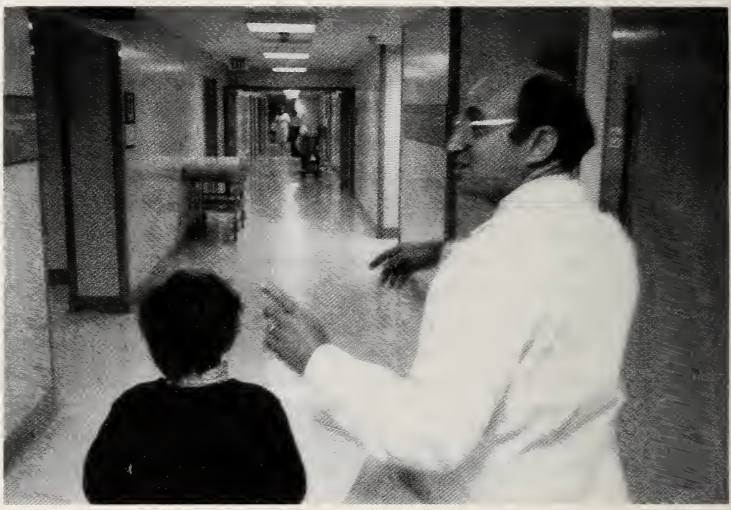
Establishment of community hospital relationships was an important legacy of Dr. Taylor. The new health manpower legislation of 1971 created funding for the development of Area Health Education Centers. The University received the largest federal grant in the AHEC program, and the single largest contract in the history of the University, amounting to $8.5 million for five years. Mr. Glenn Wilson, the first Director, played a major role in establishing the AHEC program. From the initial three Area Health Education Centers in Charlotte, Wilmington, and the Governor's Area L (Tarboro, Rocky Mount, Wilson, and Roanoke Rapids), the program has grown toward the development of a statewide system of Area Health Education Centers, nine in number, embracing the full participation of our sister health sciences schools in Chapel Hill as well as the Duke and Bowman Gray Medical Schools, and the health sciences schools at East Carolina University. Programs at the regional centers are designed to develop health manpower training to meet the needs of the 10- to 12-county regions represented by each center. The teachers at each of the centers represent a combination of volunteer, part-time, and full-time faculty broadly based in the health professions. Included among the programs are electives for senior medical students, some rotations for junior medical students, and house staff training in the primary care specialties of Family Medicine, Pediatrics, Internal Medicine, and Obstetrics-Gynecology. The program is supported by the six twin-engine airplanes operated by the Medical Air Transportation Service. This imaginative regionalized program of health professional education has promise for helping to solve North Carolina's problems of access to good medical care through better distribution of physicians and other health professionals, both geographically and by specialty. Dr. Eugene Mayer succeeded Mr. Wilson as Director in 1978.

As the academic medical center has grown in size and complexity there has been increasing concern that the scientific medicine practiced there should be properly leavened with human sensitivity, compassion, and genuine continuing interest in people and their families. The University of North Carolina Hospitals has had the reputation of being a warm, personable place while maintaining its obligation and capacity to keep clinical care at the cutting edge of the medical science.

Dr. Fordham assumed the additional responsibilities of Vice Chancellor for Health Affairs in 1977. He relinquished his duties as Dean of the School of Medicine in June 1979 and continued as Vice Chancellor until March 1980 when he became Chancellor of the University.

Dr. Stuart Bondurant was chosen to succeed Dr. Fordham as Dean of the Medical School. He assumed his duties as a great decade in the history of the School of Medicine culminated in the School's being accredited for a maximum 10-year term by the Liaison Committee on Medical Education. Dr. Bondurant's priorities for the 1980s reflected his commitment to continuing and enhancing the tradition of excellence in education of The University of North Carolina at Chapel Hill School of Medicine. Actions on these priorities included appointing a faculty curriculum review committee and establishing a Student Research and Academic Enrichment Program. A substantial number of medical students carry out research with a faculty mentor, some work leading to publications. The Curriculum Review reached a successful conclusion with full faculty approval in the spring of 1983. The new curriculum described in this catalog reflects the goals of faculty and students for the education of physicians in the 21st century.

The reader should draw from this brief history of the School of Medicine the flavor of an institution strongly based on scholarship and fundamentally committed to the scientific medicine of the present and future; it is an institution that has found ways to express these commitments through expanding innovative educational programs in Chapel Hill and throughout the State. It is a School that is equally proud of the achievements of its nationally and internationally prominent faculty in the generation of new knowledge and the excellent teaching provided to students, house staff, and practicing professionals. With this balance of efforts the School continues its tradition of service for the benefit of the health and medical care of the citizens of North Carolina and the nation.



University of North Carolina Hospitals

ERIC B. MUNSON, *Executive Director*
CHARLES F. AYSCUE, *Associate Director of Operations*
C. PETER BARNES, Assistant Director of Operations
MARY A. BECK, *Director of Planning and Program Development*
JOSEPH T. BRUGNOLOTTI, *Director of Human Resources*
SANDRA K. EVANS, *Assistant Director of Operations, Vice Chairperson of Nursing*
BENJAMIN I. GILBERT, *Director of Quality and Legal Services*
ELAINE M. HILL, *Director of Volunteer Services*
MELVIN S. HURSTON, *Associate Director of Operations*
THOMAS D. KMETZ, *Assistant Director of Operations*
MARY F. LUTZ, *Assistant Director of Operations*
PATRICIA A. MOORE, *Director of Audit Services*
FRAN ROSS, *Chairperson, Department of Nursing*
TODD L. PETERSON, *Director of Operations*
JOHN W. STOKES, *Director of Institutional Relations*
RICHARD L. TEBOCKHORST, *Assistant Director of Operations*
M. LOU THOMPSON, *Assistant Director of Operations*
Vacant, *Associate Director of Operations*

EXECUTIVE COMMITTEE OF THE MEDICAL AND DENTAL STAFF

STANLEY R. MANDEL, M.D., *Chief of Staff, Chairman*
GEORGE JOHNSON, JR., M.D., *Associate Chief of Staff for Inpatient Care*
RAYMOND P. WHITE, JR., D.D.S., PH.D., *Associate Chief of Staff for Ambulatory Care*
BEN D. BARKER, D.D.S., *Dean, School of Dentistry*
THOMAS F. BOAT, M.D., *Pediatrics*
STUART BONDURANT, M.D., *Dean, School of Medicine*
ROBERT A. BRIGGAMAN, M.D., *Dermatology*
WILLIAM DROEGEMUELLER, M.D., *Obstetrics and Gynecology*
DAVID E. EIFRIG, M.D., *Ophthalmology*
JOE W. GRISHAM, M.D., *Pathology*
ALFRED R. HANSEN, M.D., *Emergency Medical Services*
JAMES N. HAYWARD, M.D., *Neurology*
DAVID S. JANOWSKY, M.D., *Psychiatry*
WILLIAM W. MCLENDON, M.D., *Hospital Laboratories*
FRANCES ROSS, R.N., *Nursing*
KENNETH G. REEB, M.D., *Family Medicine*
SUZANNE V. SAUTER, M.D., *Rehabilitation Unit*

JAMES H. SCATLIFF, M.D., *Radiology*
GEORGE F. SHELDON, M.D., *Surgery*
P. FREDERICK SPARLING, M.D., *Medicine*
JOEL E. TEPPER, M.D., *Radiation Oncology*
ROBERT W. VAUGHAN, M.D., *Anesthesiology*

Ex-Officio Members:

TODD L. PETERSON, B.S., M.A., *Director of Operations*
ERIC B. MUNSON, B.A., M.B.A., *Executive Director*

Rotating Members:

President, *House Staff Council (chosen annually)*
Two Members-At-Large elected annually

The University of North Carolina Hospitals entity was created by the General Assembly in May 1989 as a unifying organization to govern constituent hospitals and to project a modern and accurate identity for the hospitals of the University of North Carolina at Chapel Hill.

The UNC Hospitals Board of Directors has designated the following as UNC Hospitals:

North Carolina Memorial Hospital, including the North Carolina Jaycee Burn Center and the North Carolina Clinical Cancer Center. North Carolina Memorial Hospital serves as the UNC Hospitals' major adult, acute care institution.

North Carolina Children's Hospital, presently located in North Carolina Memorial Hospitals units, provides pediatric inpatient and outpatient services.

North Carolina Neuropsychiatric Hospital, located in the South Wing Building, provides psychiatric inpatient and outpatient services.

In addition, the Board has identified the North Carolina Women's Center, the UNC Ambulatory Care Center and the Carolina Consultation Center as constituent UNC Hospitals entities.

Medical Staff

UNC Hospitals has a 659-member medical and dental staff. All attending physicians and dentists have appointments in the UNC Schools of Medicine and Dentistry. Many are full-time faculty members; the remainder are community physicians holding clinical appointments.

Residency Programs

The hospital is accredited for residencies in the following specialties: anesthesiology, dermatology, family medicine, general practice dentistry, internal medicine (and subspecialties), neurology, nuclear medicine, obstetrics and gynecology, oral and maxillofacial surgery, ophthalmology, pathology, pediatrics, adult and child psychiatry, pediatrics/medicine, radiation therapy, radiology and surgery (and subspecialties). The housestaff numbers 455.

Students are included in the patient care team early in their education. While they learn by observation and by questioning the faculty and housestaff, medical students also participate in the care of patients with appropriate supervision. The University of North Carolina Hospitals provides both tertiary care for the state and primary care for a substantial segment of the local community. More than 20,000 patients are admitted each year. There are about 300,000 visits annually to the institution's 160-plus clinics. The hospital's emergency room, which is part of a comprehensive trauma center, registers some 30,000 patients a year. Virtually all patient care areas have been renovated in the past decade. The most recent of many major additions to the hospital is the Anderson Pavilion, which houses a new critical care facility. The medical center is recognized nationally for clinical research and care in many specialized services including the N.C. Jaycee Burn Center, Comprehensive Hemophilia Center, perinatal care program and dialysis program. Thus, students and physicians in training work with innovative and specialized diagnostic and treatment modalities.

The University of North Carolina Hospitals' commitment to primary care distinguishes it from many tertiary care training centers. This approach, in conjunction with opportunities available through the Area Health Education Centers hospitals, offers students a balanced experience in providing health care. Ambulatory care services include a number of new approaches to health care delivery, including an active outpatient surgery program. The Polyclinic Practice allows continuity of care with the physician of choice, immediate specialty consultation when needed, and innovative quality assurance and health maintenance programs. The Family Practice Center and obstetrical services emphasize family-centered approaches. There also are walk-in and screening clinics that provide immediate medical attention to persons who are often missed by traditional medical practices. The Department of Pediatrics sends students and residents into the community as participants in child-related activities. Community involvement is also available through the Student Health Action Committee which provides a student-run evening clinic for southern Orange County citizens who have no other source of medical care. The Department of Family Medicine and volunteer faculty members in various health professions provide support and supervision. The hospital provides laboratory and pharmacy support.

Area Health Education Centers Program

Director: Eugene S. Mayer, M.D.
Deputy Director: John A. Payne, M.P.H.
Associate Directors: Clark W. Luikart, Ph.D., Judith E. Leonard, M.Ed., J.D., and Kathleen M. McDonald, M.S.
Senior Associate for Clinical Education in AHEC: Ernest N. Kraybill, M.D.

The North Carolina Area Health Education Centers (AHEC) Program is an unique partnership between the university health science centers and the community designed to provide: 1) off-campus education and training opportunities for medical students and residents, and; 2) ready access to continuing education and teaching activities for health professionals and practitioners throughout North Carolina.

Under the leadership of the Dean and the Faculty of the School of Medicine at The University of North Carolina at Chapel Hill, the AHEC Program has been developed in cooperation with the other UNC-CH health science schools, the Bowman Gray School of Medicine of Wake Forest University, the Duke University Medical Center and the East Carolina University health science schools (Medicine, Nursing and Allied Health). Also included in this statewide educational program are community hospitals, other university campuses, community colleges, technical institutes, and practicing professionals and support personnel.

The AHEC Program, through its nine regional centers (AHECs), is designed to:

1. Provide medical, dental, public health, pharmacy, allied health and nursing students with education and training opportunities throughout the state.
2. Enhance regional capabilities to train nursing and allied health personnel.
3. Enhance the regional capability to train primary care medical residents.
4. Provide opportunities for continuing education, in-service education, and individualized technical assistance and consultation for all health personnel.

The AHEC Program is based on the premise that the organization of the educational process can influence the practice orientation, career selection, and eventual practice location of students and residents. More specifically, the decentralization and regionalization of education and training programs will increase exposure to primary care and community practice, thus improving the likelihood that students and other trainees will choose careers in primary care and practice in medically underserved communities. Further, it is also assumed that the presence of technical assistance, information services, and educational programs in the community will improve the character of the professional practice environment, and enhance the ability of the state to improve the distribution of health manpower as needed.

The nine AHECs mandated by the General Assembly of North Carolina are established and operating as a statewide network. Each AHEC is a community hospital or an incorporated foundation representing one or more hospitals which agrees to accept the responsibility for health manpower education and training programs in a multi-county area. These programs represent a coordinated effort to provide education at the undergraduate, graduate and continuing education levels in a manner which reflects regional and statewide needs, focuses on primary care, and protects both academic quality and the integrity of health services delivery in the community.

The statewide AHEC network for health manpower education and training was implemented in 1972, and currently involves:

1. The presence of over 100 AHEC-based, full-time and part-time medical faculty, and over 40 AHEC-based full-time faculty in other health disciplines.
2. The regular presence in the AHEC regions of visiting faculty and staff from the university health science schools, and the regular presence of AHEC-based faculty at the university health science center.
3. The voluntary support and participation of community physicians and other health professionals, administrators, and support personnel from the AHEC hospitals and the AHEC regions.
4. A network of libraries and learning resource centers which connect almost all community hospitals to an AHEC and, in turn, to a university health science library.

The AHEC Program has enabled the UNC-CH School of Medicine to establish teaching programs at a number of community hospitals and practice sites throughout North Carolina. Major community hospitals affiliated with the UNC-CH School of Medicine which serve as clinical sites for AHEC rotations for medical students include: Moses Cone Memorial Hospital in Greensboro, Charlotte Memorial Hospital and Medical Center in Charlotte, Heritage Hospital in Tarboro, Nash General Hospital in Rocky Mount, Halifax Memorial Hospital in Roanoke Rapids, Wilson

Memorial Hospital in Wilson, Memorial Mission and St. Joseph's Hospitals in Asheville, Wake County Medical Center in Raleigh, and New Hanover Memorial Hospital in Wilmington.

Presently about one-third of all clinical education for UNC-CH medical students occurs in the AHECs. These well-supervised experiences are designed to develop clinical skills, to demonstrate primary care practice, and to expose students to the opportunities and challenges of community-based medical practice.

The medical student's full-time assignment of at least ten days at the end of the second year to a Physical Diagnosis course may be arranged through the AHEC Program at a facility away from Chapel Hill. All medical students spend one-third of their third-year Medicine clerkship, and may spend all or part of the Obstetrics-Gynecology and Pediatrics clerkships in an AHEC site. Assignment of the Psychiatry clerkship may be to a mental health clinic or hospital in an AHEC region. Fourth-year assignments to the Family Medicine selective frequently involve physician's offices in the AHEC regions. The fourth-year acting internship selective often takes place in an AHEC hospital and, in addition, many other clinical electives are offered in AHEC settings.

Physical Facilities

MacNider Hall was constructed in 1938 as the primary site for medical education. Additions were made in 1952. In 1963 the Medical Sciences Research Building was completed. A new research building, the six-story Swing Building, was occupied early in 1970. The Biological Sciences Research Center, including the Child Development Institute, was completed and occupied in early 1971. Buildings which previously housed nurses' dormitories and classrooms and the outpatient clinic have been renovated as office areas for the School of Medicine and for the Hand Rehabilitation Center.

Berryhill Hall, occupied in 1971, houses teaching facilities for the medical students within its eight-story structure. Students have the advantage of a modern teaching structure which provides well-equipped multidiscipline laboratories for small groups. Each medical student is assigned a laboratory desk. The desk is assigned for a year at a time and has ample storage for books, supplies and equipment. The student has free access to the desk for independent study. This building also houses a snack bar, a large student lounge, and four auditoria equipped with comprehensive audio-visual aids. Within the building also are multipurpose teaching laboratories for the basic science departments of the School of Medicine. These laboratories are used by other students in Health Affairs for whom the School of Medicine has teaching responsibility. The Division of Laboratory Animal Medicine is also housed in this building.

The Brinkhous-Bullitt Building was completed in 1973. This building houses administrative, service, and research space for the Department of Pathology, the Office of the N.C. State Medical Examiner, and the University of North Carolina Hospitals Mortuary Facilities. The Burnett-Womack Clinical Sciences Building was completed in 1975. This facility provides research and administrative space for several clinical departments. In addition, several limited-life buildings have been constructed for clinical faculty.

During the summer of 1978 activation began for the 11-story Faculty Laboratory Office Building. Housed in this facility are the Departments of Microbiology and Immunology, Biochemistry and Nutrition, Pharmacology, the Division of Laboratory Medicine, the Division of Immunology and Rheumatology in the Department of Medicine, and Laboratory Animal Medicine.

Construction began on the Lineberger Cancer Research Center Building in December 1981. The 35,000 square-foot, three-story building opened in January 1984. Its site is between Manning Drive and King Street, behind the Faculty Laboratory Office Building.

The Lineberger Cancer Research Building provides administrative offices, a library and conference room, laboratory and office space for faculty investigators and facilities for research in chemical carcinogenesis, recombinant DNA and viruses. In addition, the building has specialized rooms for existing tissue culture and electron microscopy.

STUDENT HEALTH SERVICE

Director: Judith R. Cowan, M.D.

The Student Health Service, a member of the Division of Student Affairs, is located in a facility in the northeastern corner of the medical center complex and has the overall responsibility for the health care of all students in the University. You are eligible for health care in the SHS if you are a student who has paid the student health fee for the current semester or summer session. The fee covers the cost of all services provided by SHS professionals including physicians, physician extenders, physical therapists and mental health professionals. Laboratory and x-ray studies done at SHS require a nominal co-payment. Additional charges are made for inpatient rooms, drugs, miscellaneous supplies, and laboratory and x-ray studies which must be obtained from the University of North Carolina Hospitals or other outside laboratories. Spouses who are not enrolled in the University as students are eligible by paying the student health fee at SHS.

The SHS provides a comprehensive program of health care delivery including general outpatient and inpatient medical care, a pharmacy, and specialized clinics in Allergy, Gynecology, Sports Medicine and Mental Health. Preventive services include immunizations and those other preventive services normally expected in any community or public health service facility. The Wellness Resource Center is staffed by SHS and trained peers. Workshops, groups and information are available on fitness, nutrition, human sexuality, contraception, relaxation and alcohol abuse prevention.

Office hours are 9:00 a.m. to 4:30 p.m. Monday through Friday and 9:00 a.m. to 12:00 noon on Saturday. Students are seen on an appointment basis. Refer to your phone directory for the correct numbers for the various clinics. After regular office hours and on weekends, nurses are available for acute care with medical and psychiatric backup. In general, students should go to the SHS first. This is particularly important for those students enrolled in The University endorsed Student Group Insurance Plan. Major problems may be referred to the University of North Carolina Hospitals Emergency Room. Students should be aware that the University of North Carolina Hospitals services are *not* covered by the student health fee.

The University has made arrangements with Blue Cross/Blue Shield to offer group health insurance coverage, including major medical benefits to enrolled single and married students, their spouses and children. This plan has been specially tailored to the needs of the student population, and to coordinate with the Student Health Service in ways that may not be true of other insurance plans. The medical school administration strongly recommends that you purchase this, or comparable, coverage **including the optional catastrophic coverage.** The catastrophic coverage is available for only a small additional fee and greatly improves your insurance coverage. The administration believes that you should have the University endorsed plan with catastrophic coverage (or a comparable plan) for the following reasons:

1. the student health fee does **not** cover hospitalization, surgery, and intensive care, among others;
2. clinical training may pose health risks beyond those encountered by the general population;
3. medical students are required to complete some of their training at sites distant from Chapel Hill, and thus need health insurance coverage for times when they are unable to report to the Student Health Service.

We are currently working to make this coverage more beneficial for your needs. For information, contact Hill, Chesson and Associates (Insurance Brokers), P.O. Box 3666, Chapel Hill, NC 27514 (919) 967-5900.

North Carolina law requires all students new to the University to document immunization records and undergo vaccination. Failure to comply results in cancellation of registration 30 days after classes begin.

VETERANS AFFAIRS

Veterans affairs and claims for veterans benefits are handled by the Office of Veterans Services, CB 2100, 101 Hanes Hall, the University of North Carolina, Chapel Hill, NC 27599-2100 (919-962-8292).

HOUSING

The University provides residence hall accommodations for approximately 6600 registered undergraduates, graduates and professionals. Three hundred and six apartments are available for student family housing and these apartments are conveniently located near the medical center.

Information regarding residence hall accommodations is available through the Department of University Housing, Contracts Office, CB 5550, Carr Building, the University of North Carolina, Chapel Hill, NC 27599-5550 (919-962-5401).

Information regarding student family housing is available by through the Student Family Housing Office, CB 5550, Odum Village, Branson Street, Chapel Hill, NC 27519-5550 (919-962-5661).

Health Sciences Library

The Health Sciences Library, located on Columbia Street with the entrance facing the MacNider Building, has facilities, collections, and staff which place it among the top fifteen of over 135 U.S. and Canadian medical school libraries. The six-story building, finished in 1982, has seating for 730 users. The collection includes about 247,000 print volumes, 4,400 audio-visual programs, 36,000 microform pieces, and current subscriptions to about 4,500 periodicals. A fine rare books collection is supported by the Anderson-Riggins endowment.

Staff serve the information needs of students, faculty, and staff of the Division of Health Affairs, the North Carolina Memorial Hospital, and health care professionals in North Carolina through the Area Health Education Centers (AHEC) program. The library offers a wide range of information assistance, including aid in locating factual and bibliographic information, mediated and self-services search services, information management education programs, individual instruction in the use of information sources, circulation of library materials, interlibrary loan services, photocopy services, and a reserve collection for assigned course materials. Information Services librarians search over 75 different computer databases including MEDLINE, TOXLINE, HEALTH PLANNING AND ADMINISTRATION, BIOSIS, PSYCINFO, *Excerpta Medica, Chemical Abstracts,* and *Science Citation Index.*

Assistance for individual searching is available in the Electronic Information Center. The department of Information Management Education Services coordinates orientations for new library users and offers special library and classroom lectures and courses on such topics as filing systems, information sources in specific fields and practical use of the library and online searching for health professionals. The large learning resources center contains carrel and group study seating and provides equipment for using IBM PC and MacIntosh software, 35 mm slides, ½ and ¾ inch videocassettes, videodiscs, audiocassettes, and microforms.

The Health Sciences Library is directed by Carol Jenkins. Additional information regarding the services and collections of the Health Sciences Library may be found in the library's Information Series and in its newsletter "News & Views."

Telephone inquiries should be directed to Information Services (962-0700), Circulation Services (962-0800), Learning Resources Services (962-0600), or Administrative Services (966-2111).

The University libraries serving the Division of Academic Affairs including the Wilson and Davis Libraries and scientific departmental libraries are also available to students and faculty of the School of Medicine. The total collections of the libraries in Chapel Hill now exceeds 3,000,000 volumes. Information about the collections on this campus, as well as Duke and North Carolina State University libraries, is available in an online catalog accessible in the library or from individual workstations.

Admissions

The University of North Carolina School of Medicine has a special opportunity and responsibility to educate physicians who can help meet the health care needs of the state and the nation. Because the size of entering classes is fixed, not all worthy applicants can be admitted. It is the duty of the Admissions Committee acting for the Dean and the Faculty to select the students who in its judgment will best provide excellence and beneficial diversity in the student body.

Admissions preference is given to North Carolina residents, and it has been the consistent policy of the School of Medicine to consider classifications for tuition purposes as determining residency classification for all admissions decisions.

The School of Medicine is a participant in the American Medical College Application Service (AMCAS). Information provided in the AMCAS application is used to predict success in medical studies. North Carolina residents who have demonstrated adequate preparation and ability are invited to complete a supplementary application.

Through the supplementary application and personal interviews, each applicant is given the opportunity to acquaint the Committee with his/her unique attributes. In making its final selections from the group of qualified in-state applicants, the Committee considers evidence of each candidate's motivation, maturity, industry and integrity, as well as the scholastic record. To provide a heterogeneous student body, the Committee considers a variety of individual qualifications and accomplishments. All information available about each applicant is considered without assigning priority to any single factor. No special admission tracks or quotas are applied among in-state applicants.

The number of nonresident applicants who can be admitted is limited. The Committee is extremely selective in inviting out-of-state applicants to submit supplementary applications and to come to Chapel Hill for interviews. The Committee offers admission to a few nonresident students judged especially able to contribute excellence and diversity to the student body.

All admissions to the School of Medicine are the ultimate responsibility of the Dean. The Dean and the Committee reserve the right to exercise their judgment in selecting a student body deemed best qualified to meet the objectives of the School.

ACADEMIC REQUIREMENTS FOR ADMISSION

1. Requirements for admission are under review and are subject to change. At this time a minimum of 96 semester hours of accredited college work is required.[1] Students are encouraged to pursue one or more scholarly interests in depth during the undergraduate years, but course work must demonstrate proficiency in the natural sciences. Specific courses include:

	Sem. hrs.
English	6
Biology including vertebrate zoology with labs	8
Inorganic and organic chemistry including courses in qualitative and quantitative analysis with labs	16
General physics with labs	8

2. Beyond the fixed requirements, a wide variety of undergraduate educational experiences are appropriate to medicine. The School values a pattern of preparation for medicine which shows serious and mature use of the undergraduate years. Course work in the humanities and social sciences, as well as advanced work in the sciences and mathematics, is valued. Proficiency in the use of the English language is essential.
3. Beginning in April 1991, the revised version of the MCAT will be required of all applicants. The test must be taken no later than the fall, one year prior to the entering date for which the student is applying. Application for the test is made directly to the American College Testing Program, P.O. Box 468, Iowa City, IA 52240.

PROCEDURE FOR APPLICATION

1. Obtain application forms from the American Medical College Application Service (AMCAS), Association of American Medical Colleges, 1776 Massachusetts Ave., N.W., Suite 301, Washington, DC 20036 (202-466-4666). The UNC deadline for the class entering in August is November 15 of the previous year. Applicants are notified when the AMCAS application has been received by the UNC School of Medicine. The AMCAS application is reviewed by the Committee. Academically qualified North

---

[1] A few University of North Carolina undergraduate students with superior academic credentials may qualify for a B.S. in Medicine degree. Eligibility for this degree is dependent upon: a) admission to the School of Medicine; b) completion of at least the last year of premedical work at the University of North Carolina, and; c) satisfactory completion of the first year of the School of Medicine. Specific course requirements for this degree can be obtained from the College of Arts and Sciences.

Carolina applicants and selected nonresident applicants are sent a supplementary application and instructions for proceeding with the admissions process.

2. Complete all supplementary material which includes:
   a. A supplementary application form
   b. The form(s) relating to claiming North Carolina residence for tuition purposes.
   c. Letters of recommendation: an evaluation from the Premedical Advisory Committee, or when no such report is available, two letters of recommendation from faculty members (at least one science instructor and one in the applicant's major field.) Any additional letters from responsible persons well acquainted with the applicant are welcome but not required.
   d. A nonrefundable, nondeductible application fee of $35.00.[2]

Applicants submitting the supplementary applications usually are invited for interviews.

Applicants will be notified when their files are complete. Careful consideration of all applicants is a time-consuming process, and selection of the class is not complete until spring. Applicants are notified when action has been taken by the Committee.

EARLY DECISION PLAN

The UNC School of Medicine participates in the AMCAS Early Decision Program. The admissions philosophy and procedures outlined above are applied to early decision applicants. Highly qualified applicants are encouraged to consider the Early Decision Plan as outlined in AMCAS instructions.

EARLY ACCEPTANCE COMMITMENT PLAN

The University of North Carolina School of Medicine offers an early acceptance commitment to selected sophomores enrolled at UNC-CH who are confident that medicine is their career goal and who have a mature plan to use their final two college years to obtain a particularly broad and rich academic experience.

---

[2] Policy about fee waivers is similar to that of AMCAS. Applicants who have been granted a fee waiver by AMCAS may write the Admissions Office to request the waiver. Accepted applicants are required to make a deposit of $100 to hold their places in the class. This deposit is refundable prior to June 15; if the applicant registers in August, this amount is applied to tuition fees.

Eligibility:

Only fulltime UNC-CH students classified as second semester sophomores will be considered. Candidates must be able to complete the following course requirements by the end of their sophomore year:

	Sem. hours
English	6
Biology, including vertebrate zoology with labs	8
Inorganic & Organic chemistry, including courses in qualitative & quantitative analysis with labs	16
General Physics with labs	8

Candidates will take the MCAT (Medical College Admissions Test) in April of their sophomore year.

Selection Factors:

While there is not a fixed threshold for grade point average or MCAT scores, successful candidates will have a performance record that demonstrates seriousness of purpose, aptitude for scholarship, and, as a consequence of being assured of medical school admission, special potential for growth during their junior and senior years. There is no preference among academic majors but premature commitment to any narrow discipline is discouraged. Consideration will be given to the candidate's willingness to take on a challenging and broadening course of study during his/her freshman and sophomore years, especially in fields outside the sciences, as demonstrated, among other ways, by taking courses in the Honors Program curriculum. Non-academic interests and accomplishments, motivation for a career in medicine and behavioral evidence of concern for the welfare of others receive appropriate emphasis in the selection process. A major consideration is the quality of each candidate's proposal for how the last four undergraduate semesters will be spent. It is expected that this proposal will outline a course of study significantly broader than what is normally regarded as a "pre-med" major, i.e., a major concentration in the humanities, fine arts, or social sciences; an interdisciplinary or double major relating science to other disciplines; or the inclusion of a substantial foreign study experience. Students accepted to the program are encouraged to participate in the senior honors thesis experience.

Application:

Interested students may obtain application materials in Room 130 MacNider at the School of Medicine. The applicant must arrange to have a letter of recommendation sent directly to The Committee on Admissions of The School of Medicine, from two UNC-CH faculty members who have taught him/her. Personal interviews with members of the Admissions Committee will be scheduled in April. Final acceptance decisions into the program are made during the summer when applications are complete and Spring semester grades and MCAT scores are in hand. All admissions decisions are made by the Committee on Admissions acting for the Dean. The School of Medicine reserves the right to limit early acceptance to a small group of students who in the judgment of the Committee can best profit from this opportunity.

Statement of Equal Educational Opportunity

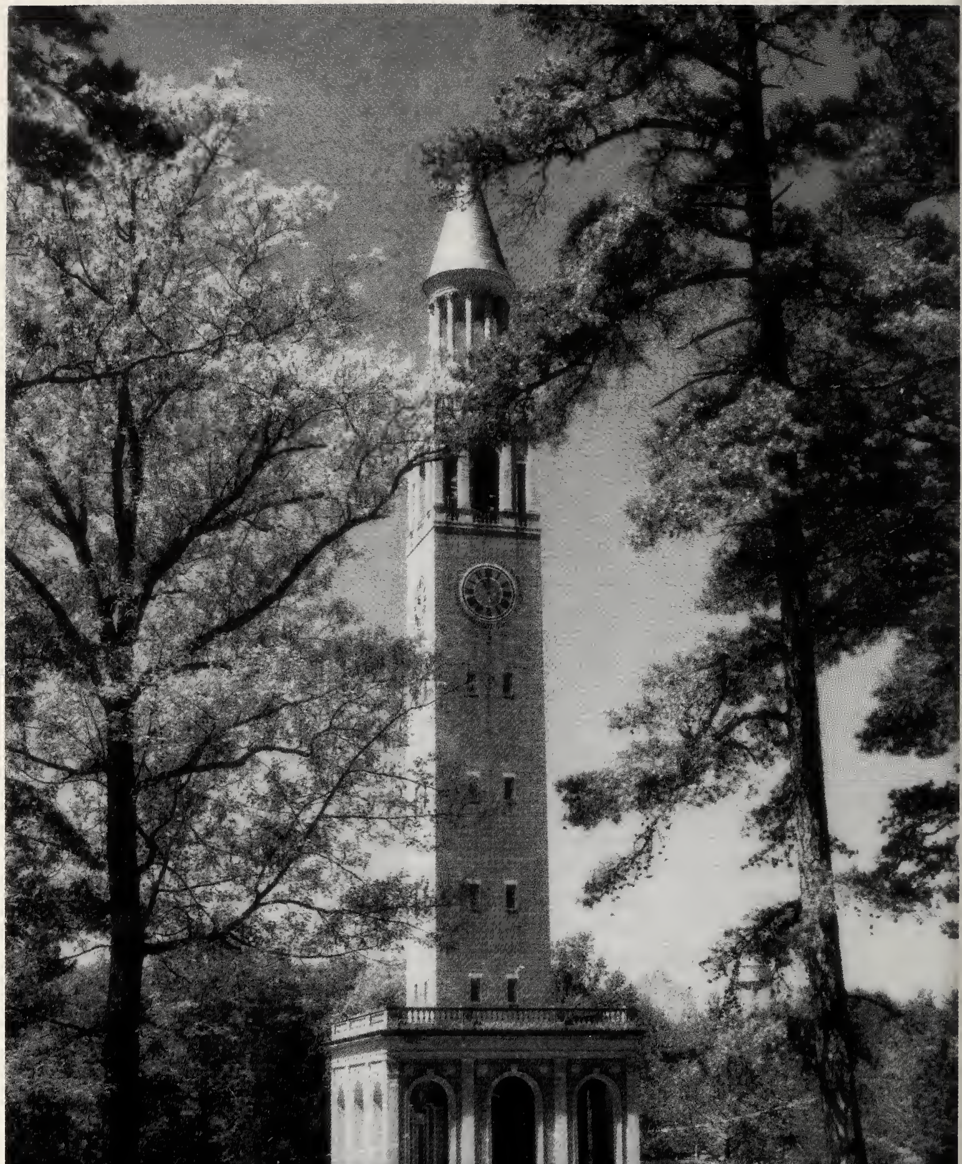
The University of North Carolina at Chapel Hill is committed to equality of educational opportunity and does not discriminate against applicants, students, or employees based on race, color, national origin, religion, sex, age, or handicap. Any complaints alleging failure of this institution to follow this policy should be brought to the attention of the Assistant to the Chancellor. Moreover, the University of North Carolina at Chapel Hill is open to people of all races and actively seeks to promote racial integration by recruiting and enrolling a larger number of black students.

TRANSFER/ADMISSION TO ADVANCED STANDING

It is the policy of the School of Medicine to limit consideration for transfer/advanced standing admission to the third year. Placements are contingent upon vacancies in the class. Only two categories of candidates may apply:

1. Medical students enrolled and in good standing at a medical school accredited by the Association of American Medical Colleges.
2. Selected residents in the Oral Surgery Program at the UNC School of Dentistry.

Eligible applicants may obtain application materials by writing to the Office of Admissions, School of Medicine, CB 7000, 130 MacNider Building, University of North Carolina, Chapel Hill, NC 27599-7000 (919-962-8331).



Combined Degree Programs

The M.D./Ph.D. Program

The School of Medicine and the Graduate School offer a combined M.D./Ph.D. Program designed for selected students who aspire to an academic research career in the biomedical sciences. The program offers the opportunity to combine graduate education and doctoral research in a basic science and the clinical studies for the medical degree. The requirements for both the Ph.D. and the M.D. degrees should be completed in seven years, although the research interval required is not fully predictable.

The Ph.D. degree in the combined program may be earned in a variety of disciplines related to biomedical sciences. These include, but are not limited to programs in Cell Biology and Anatomy, Biochemistry, Microbiology and Immunology, Pathology, Pharmacology, Physiology, Biomedical Engineering, Genetics, Neurobiology, Toxicology, Epidemiology, Parasitology and Biostatistics. By special arrangement students may be able to enter graduate programs in Chemistry, Biology, and certain social sciences in the College of Arts and Sciences.

Applicants must apply both to the Medical School and to the selected graduate program at the same time, and must fulfill the requirements for admission to both the School of Medicine and the Graduate School, including both the Medical College Admissions Test and the Graduate Record Examination. Those students selected for the program will spend year one in the graduate program, years two and three in the Medical School, years four and five in the graduate program, and years six and seven in the Medical School clinical programs.

Stipends of $9,000 for the first year and $10,000 for years two, three, six and seven are currently available for two students each year, beginning in 1988. Comparable stipends may be available for years four and five in the selected graduate programs.

Description of the graduate courses in the various departments and curricula can be found in the Record of the Graduate School. Further information may be obtained from the Office of Admissions, School of Medicine, CB 7000, 130 MacNider Building, University of North Carolina, Chapel Hill, NC 27599-7000 (919-962-8331).

The M.D./M.P.H. Program

Through a cooperative arrangement between the School of Public Health and the School of Medicine, UNC medical students interested in preparing for careers that combine clinical medicine with epidemiological investigation, health policy, medical administration, or public health practice (either in the United States or internationally) may pursue a dual degree program leading to the M.D. and a degree in public health either at the master's or the doctoral level.

Students who have made formal application and have been accepted by a department in the School of Public Health and by the Graduate School must enroll in the School of Public Health full time—usually following the third year of medical school—in order to complete degree requirements. Among the graduate programs in public health that frequently include medical students are those of the Departments of Epidemiology, Health Policy and Administration, and Maternal and Child Health. Students may receive elective credit in the School of Medicine for up to fifteen hours of course credit earned toward a public health degree. Such medical school elective credit must, however, be applied for and approved by the School of Medicine before the course is taken.

Graduate Studies in the Humanities and Social Sciences

UNC medical students who are interested in preparing for careers that combine clinical medicine with medical anthropology, medical ethics, health economics, the history of medicine, and other medically related areas in the humanities and social sciences, may pursue graduate studies in one of these areas during the time they are matriculated as students in the School of Medicine. Although no formal combined degree program exists for these areas of study, qualified students may earn the M.D. degree and another graduate degree at either the masters or the doctoral level in a shorter period of time than would be required if both degrees were pursued separately. This can be accomplished through judicious use of free time and through elective options that have been approved by the School of Medicine.

Students who have made formal application and have been accepted by a graduate department and by the Graduate School must enroll as full-time students for a minimum of one year—usually following the third year of medical school—in order to complete degree requirements. Students pursuing a graduate degree in a medically related area of the humanities or social sciences may receive elective credit in the School of Medicine for up to fifteen hours of course credit earned toward the graduate degree. Such medical school elective credit is granted only for medically related graduate courses and must be applied for and approved by the School of Medicine before the course is taken.

Medical students wishing to consider either the M.D./M.P.H. Program or a graduate program in a medically-related area of the humanities or social sciences should take the following steps:

1. Consult with the medical school advisor for graduate studies in social medicine;

2. Request an informal interview with a representative of the graduate program desired;
3. Apply for admission to the desired graduate program through the Graduate School (admissions procedures vary with each department, but application should generally be made at least six months before the medical student intends to enroll in the graduate program);
4. Obtain a leave of absence from the School of Medicine through the Associate Dean for Student Affairs;
5. Register and matriculate in the graduate program for one academic year;
6. Complete all requirements for the graduate degree as specified by the graduate department;
7. Complete all requirements for the M.D. degree as specified by the School of Medicine.

The advisor for graduate studies in social medicine is Dr. Donald Madison. Interested students may contact him at the Department of Social Medicine, CB 7240, Wing D, University of North Carolina, Chapel Hill, NC 27599-7240 (919-962-1136).

Descriptions of individual graduate programs and courses offered by departments in the School of Public Health and by other departments in the Graduate School can be found in the Record of the Graduate School, the Record of the School of Public Health, and in materials issued by the various graduate departments.

Financial Information[1]

ESTIMATED EXPENSES

Tuition	*N.C. Resident*	*Non-Resident*
A. Fall/Spring or Summer	$672.00	$5,924.00
B. Elective, per unit (4 weeks)	$192.00	$1,693.00
C. Clerkship per unit (6 weeks)	$188.00	$1,658.00
D. Clerkship per unit (12 weeks)	$390.00	$3,438.00
Fees		
A. Fall/Spring or Summer	$203.50	$203.50

FINANCIAL REQUIREMENTS FOR REGISTRATION

1. Tuition and fees are due at registration for each semester or summer session. Accounts not paid in full by the University's official first day of class, are subject to a late payment fee and the student's possible disenrollment.
2. Students who have previously outstanding obligations to the University that are not cleared prior to the deadline for completion of registration, will not be allowed to register, and will be dropped from the class roster as well as from classes, clinical clerkships, or electives. Such measures could interfere with a student's ability to be promoted or to graduate on time. The University requires strict enforcement of its policy that students who owe money or have other outstanding obligations to the University will not be allowed to progress in the school until these obligations are cleared.
3. Registration and enrollment in this School of Medicine and payment of appropriate tuition and fees will be necessary for courses for which a student wishes to receive credit toward the M.D. degree. This includes clerkships and electives arranged at the other institutions in this country or abroad, as well as at the School of Medicine in Chapel Hill.

ADDITIONAL ESTIMATED EXPENSES

First Year

Books, laboratory manuals, laboratory costs	$500.00
Instruments variable, depending upon microscope cost. Binocular microscopes will be available to all students at the rate of $50.00 per year.	
Purchase price varies:	$200.00–$600.00
Microscope service fee	$50.00
Instruments	$460.00

---

[1] The University reserves the right to make, with the approval of the proper authorities, changes in any fees at any time. Tuition rates shown are effective Spring Semester 1990. Tuition and fees for the academic year 1990–91 to be determined.

Second Year

Books, laboratory manuals, laboratory costs	$460.00
Instruments	$150.00
Microscope service fee	$ 50.00
Hepatitis B	$110.00

Third Year

Books, uniforms	$550.00

Fourth Year

Books, uniforms	$550.00

Microscopes

Microscopes owned by the School of Medicine are available for loan to first and second year medical students for a service fee of $50 per year. These microscopes are modern, binocular, four-objective, fully equipped instruments, but without carrying cases. A microscope is reserved for each entering student and will be issued during Registration upon payment of the fee. It is advantageous for most students to use the School-owned microscopes, and the School does not recommend that students purchase a personal microscope at this time.

If a student wishes to use a personal microscope it must be inspected and approved. Microscopes should be brought to Room 314 Berryhill (Basic Medical Sciences Building) at the earliest possible date after acceptance. If possible, do not purchase a microscope prior to its inspection.

FINANCIAL AID

The Medical School Student Aid Committee, with the approval of the Dean, is responsible for recommending students for scholarships and loans. The Student Aid Officer of the School of Medicine is available by appointment in 121 MacNider Building to discuss financial matters with students throughout the year. The Director of Student Aid, CB 2300, 300 Vance Hall, University of North Carolina, PO Box 1080, Chapel Hill, NC 27599-2300, is responsible for the entire student financial assistance program at the University. Additional financial counseling is available at the Student Aid Office.

The University of North Carolina at Chapel Hill has long upheld a tradition of helping individuals of modest financial means to reach their full potential by completing their education. Continuing with this tradition, financial assistance is available in a variety of forms at the Medical School to supplement funds provided by family, from savings, and through the student's summer work. No qualified student who sincerely desires a medical education and who has documented financial need should hesitate to apply for aid.

To qualify for financial assistance, the applicant must be a full-time medical student in good standing and registered in the School of Medicine of The University of North Carolina at Chapel Hill. Any student taking more than 50 percent of the full academic load for credit during the fall or spring semester will be considered for aid during that semester. Any student taking 50 percent or less of the full academic load for a semester will be considered a full-time student only for the time he is taking work for credit, i.e., a student who is taking one or two electives for credit during a semester will be considered a full-time student only during the time he is taking those electives, and would be eligible for aid only during that period of time.

A student, however, taking three electives for credit in a semester would be considered a full-time student for the entire semester and aided fully for the entire semester. In the summer enrollment period a student eligible to receive aid will be considered a full-time student only during the time he is taking Medical School work for credit, and will receive aid only during that period of time.

The need for financial assistance must be demonstrated. Financial need of an applicant, whether married or single, will be determined by evaluation of the total resources available to him/her. The applicant and his/her family are expected to assist all they can from personal resources. Applicants will be required to document their unusual expenses. Although it is obvious and understood that each budget will vary and will have to be assessed on individual merit, the University has established what it considers reasonable figures for living expenses in the Chapel Hill area, for both married and single students, and any budget exceeding these figures must be justified by a written description of unusual circumstances.

Funds needed to repay existing obligations outside of the ordinary academic and subsistence expenses cannot be made available through University resources.

If a student receives funds from a source outside the University and also expects to receive University financial aid, the student must apply these outside funds to educational expenses accepted by the University.

A student is 'in good standing' if he/she has satisfied the requirements for enrollment and is enrolled.

Definition of normal progress. Unless a longer period is specifically approved by the Dean in an individual case, a student is considered to be making 'normal progress for purposes of financial aid' if, at any time upon the evaluation of the student's record by appropriate University officials, the student remains able to complete thereafter the requirements of the M.D. degree within a total period of 6 academic years and 4 summer sessions of course work. This time is determined to begin with the first day of classes of the semester in which the student entered medical school. This does not mean that the student must complete the requirements of the M.D. degree without interruption. A student in good standing could, with the approval of the appropriate officials of the University or the Medical School, be given a leave of absence for a period of time not to exceed two calendar years, and could return at the conclusion of such a leave of absence and complete the work. A student may be able to withdraw from a course if given appropriate permission to do so, receive an Incomplete on one or more courses or a longer period of work, participate in required or voluntary remedial or tutorial activity, repeat a course or a longer period of work (such as an academic year), and still be eligible to receive financial aid provided the student remains able, at the time any of these activities are taking place, to complete the requirements for the M.D. degree within the total time period defined above.

The stated timeframe of 6 academic years and 4 summer sessions should in no way be construed as limiting in any way the Promotions Committee's prerogative to recommend to the Dean dismissal, remedial work, or other appropriate actions at any time during a student's period of enrollment in Medical School, even if it would otherwise be possible for a student to complete the requirements of the M.D. degree within the stated total time.

Where fitting, a period of time longer than 6 academic years and 5 summer sessions may be considered as making 'normal progress' for those students pursuing a combined M.D.-Other Graduate Degree program(s) in the medical school. Because of the variability of the educational requirements in these different graduate degree programs, the exact length of time that will be allowed for the student to complete his/her particular combined degree program and still be considered as making normal progress, will have to be determined on an individual basis by the appropriate University officials.

EMPLOYMENT

Part-time work by medical students during the school year is generally discouraged, except on a very limited scale, although there are numerous opportunities for summer jobs and research. Information about summer jobs at other locations is available upon inquiry of the Student Aid Office in the School of Medicine.

FEDERAL SERVICE AWARDS

The largest single sources of direct assistance to medical students at present are the federal service awards. The Armed Forces scholarships are awarded by the Federal Government to medical students who obligate themselves for a minimum of two years of specified service after completing their medical training. The National Health Service is only considering recipients of the Exceptional Financial Need for application to their program. The programs provide a monthly stipend plus payment of full tuition and fees for students while in medical school.

After medical training is completed, the recipients perform professional services in the public health sector, or military services at the appropriate salary for the Civil Service level or military rank. Prospective applicants are urged to carefully consider the long-range effect of the required service obligation. Applications are not available at the Student Aid Office of the School of Medicine for the National Health Service Scholarship Program or military programs. Students interested in these programs should write to the respective services.

PROCEDURE FOR APPLYING FOR FINANCIAL AID

The necessary forms for application for financial assistance and instruction for their submission may be obtained from: Medical School Student Aid Office, CB 7000, 121 MacNider Building, School of Medicine, University of North Carolina, Chapel Hill, NC 27599-7000 (919-962-8335).

The same application forms will be submitted for both loans and scholarships (grants-in-aid), and all students who apply will be considered for both types of assistance.

DEADLINES: All students who anticipate that they will need financial assistance during an academic year should have their applications filed with the Medical School Student Aid Office by March 1, for consideration for summer and/or academic year awards. Late applications will be accepted if circumstances make it impossible to submit an application prior to the deadline, or if unexpected need arises at a later date. Late applications will be processed after the on-time applications, if funds are available.

A statement advising disposition of each application will be forwarded to the applicant as soon as possible, usually sometime during the summer. *A summer address, therefore, should be included in the application and the Medical School Student Aid Office should be advised on any change of this address.*

LOANS

Loan funds are available from the following sources:

The University Student Aid Office. To students who can qualify on the basis of need, the University offers extended loans under very favorable terms. Under the provisions of the Health Professions Education Assistance Act of 1976, when exceptional financial need can be shown, students may borrow up to $2,500.00 per year plus cost of tuition. Repayment extends over a 10 year period with monthly payments and a low interest rate.

In addition to funds made available by Federal appropriations, the following loan funds are under the supervision of the University Student Aid Office and are available to medical students:

The Kellog Loan Fund. Through the generosity of the W.K. Kellog Foundation, a sum was granted to the School in 1942 to be used for scholarships and loans to needy medical students; the scholarship fund has been exhausted. The loans from this fund are made on the basis of need, character, and scholastic attainment.

The Lynn McIver Medical Students Fund. (Established in 1959). The will of Elva Bryan McIver provided for the sale of a farm in Lee County to establish a loan fund in memory of her late husband, Dr. Lynn McIver, Medical Class of 1899, to be used by worthy, deserving students of good character in the School of Medicine.

The Dr. and Mrs. Edgar B. Jenkins Student Loan Fund. This loan fund for medical students was established in 1965 by a gift from Dr. and Mrs. Jenkins, alumni of the University of North Carolina, and will be used to assist worthy students in financing their education.

College Foundation, Inc. Federally Insured Student Loan. The College Foundation, Inc. (CFI) in Raleigh, North Carolina administers this federally insured guaranteed loan for in-state students. A student may borrow up to $7,500 per year at 8% if s/he is a first time borrower and if the loan is requested after September 13, 1983. The interest rate for renewal applicants will remain at 7% if their first loan was awarded prior to January 1, 1980. Other renewal applicants will receive loans at 9%. The aggregate loan maximum is $54,750.

DEADLINE FOR APPLICATIONS IS 45 DAYS PRIOR TO THE END OF THE SPRING SEMESTER.

The National Direct Student Loan (NDSL) Program is for students enrolled at least half-time in a participating post secondary institution and who need a loan to meet their educational expenses.

Provisions of the National Direct Student Loan Program:

1. A student may borrow up to a total of $12,000.00 for professional or graduate study. (This total includes any amount borrowed under NDSL for undergraduate study.)
2. The student may be allowed up to 10 years to pay back the loan, with a 6 month grace period. During the repayment period, the student will be charged a 5% interest on the balance of the loan principal. Repayment is deferred when the borrower is engaged in several specified activities, including internships, for a fixed period of time. The promissory note for NDSL details deferments.
3. Generally NDSL's are limited to $3,000.00 or less per year because of the amount of funds available.

The Student Loan Program for Health, Science and Mathematics. The purpose of this student loan program is to provide financial assistance to North Carolina residents who demonstrate need as determined by the board. Loans are available for study in the medical fields, mathematics and science programs that lead to a degree. A specialized course of study, internship or clinical affiliation qualify only if it is a requirement for the degree. Financial need is a consideration, and loans are not available for a partial academic year of less than full-time enrollment, or repeating academic work previously supported by the student loan program funds except where such coursework is being carried concurrently with full-time coursework in the succeeding class.

The application form and supporting information must be received by the student loan office not later than 60 days from the date the application packet is mailed to the student, with the exception of the certification of admission or promotion, whichever is applicable. Applicants will be notified of the student loan program's decision not later than 60 days following completion of the application.

The maximum amount for each full academic year is $6,000 for students pursuing a doctoral degree. The total maximum is $24,000 for four years.

If you are interested in this loan program, please contact the Student Loan Program, 116 West Jones Street, Raleigh, NC 27611. Telephone: (919) 733-2164.

The Clarke-Luther Medical Student Emergency Loan Fund. This fund was established in August 1979, by Mr. and Mrs. C. Lee Clarke and other members of the Clarke and Luther families. These funds will be used for short term loans to medical students who are in need of emergency assistance. The maximum loan a student may carry at any one time is $300.00.

The Medical Parents' Emergency Loan Fund. The Medical Parents' Club of The University of North Carolina at Chapel Hill has established a fund to be used as an emergency loan fund for students of medicine. The loans are short-term and the maximum loan a student may carry at any one time is $300.00.

SCHOLARSHIPS

The majority of medical school scholarships are essentially grants-in-aid and are awarded primarily for financial need. The number of these scholarships awarded, and the amount of an individual award will depend upon the funds available, the need of the individual applicants, and the number of applicants qualifying for financial assistance.

Funds for these scholarships originate from the following sources:

1. Alumni gifts to the Medical School;
2. Individuals and families who have established scholarships;
3. Foundations and business firms;
4. General scholarship funds of The University of North Carolina at Chapel Hill.

All medical school classes are eligible to receive financial assistance from grants-in-aid scholarships. These scholarships, however, are not intended to be used as the sole means of financial help, and in general the eligible student needing financial aid will be expected to apply for loan assistance as well.

When an award has been made the recipient will be notified by letter, and checks will be issued to individual students at the University Student Aid Office, CB 2300 Rm. 300 Vance Hall, University campus.

Renewal of awards is not automatic from year to year, and a renewal application must be submitted each year by the deadline prescribed.

The Exceptional Financial Need Scholarship for the First Year Students was authorized by Congress in 1976 and funded for the first time in the 1978–79 academic year. The scholarship provides full payment of tuition, fees and books, plus a generous 12 month stipend for first year only. Recipients are chosen from those first-year applicants for financial aid who document exceptional need. Only a very small number of those scholarships are available each year depending upon funds appropriated by Congress.

The W. Reece Berryhill Mecklenburg Medical Scholarship was established in 1971 by the UNC Medical Alumni and Friends of Mecklenburg County to honor Dr. W. Reece Berryhill, Dean Emeritus of the School of Medicine and Sarah Graham Kenan Professor of Medicine. The scholarship commemorates Dr. Berryhill's birthplace in Mecklenburg County, and in selecting a recipient, first priority will go to Mecklenburg area residents.

Board of Governors' Medical Scholarship. Minority and disadvantaged students admitted to the School of Medicine are eligible to participate in the Board of Governors Medical Scholars Program. Those students who are selected receive annual stipends of $5,000 plus tuition and fees. Recipients must be residents of North Carolina, who are enrolled in the School of Medicine on a full-time basis and who demonstrate financial need.

The Mark R. Braswell Medical Scholarships were established in 1966 in honor of Dr. Mark R. Braswell, Medical Class of 1884, of Rocky Mount, North Carolina. These scholarships are to be awarded annually to worthy medical students who have financial need.

The Pat and Kathryn Brown Scholarship was established in 1970 through a bequest from A. Pat Brown of High Point, North Carolina, to provide scholarship aid to qualified students attending The University of North Carolina at Chapel Hill School of Medicine.

The Charles H. Burnett Scholarship was established in 1967 by The University of North Carolina Medical Parents' Club to honor Dr. Charles H. Burnett, the first Chairman of the Department of Medicine in the four-year school, and former Professor of Medicine. The scholarship is awarded annually to an entering medical student on the basis of merit and need.

Carolina Country Family Medicine Scholarship was established in July 1975 by James A. Chaney, editor of the "Carolina Country Reader," in conjunction with the Moore Publishing Company of Durham, N.C. The purpose of this scholarship is to encourage medical students to become family doctors serving rural patients.

The Kenneth Raynold Edwards and Alfred Llewellyn Hobgood, Jr., Scholarship Fund was established in 1963 by Mr. Kenneth R. Edwards—a resident of Richmond, Virginia, and formerly of Henderson, North Carolina—before his death, to help worthy young men and women who would be unable to pursue a medical education at The University of North Carolina without financial assistance.

The S.M. and H.H. Fleishman Scholarship was established to assist needy medical students to continue and complete their medical education.

The Dennis Luther Fox Memorial Scholarship was established in 1953 through a gift to the Medical Foundation of North Carolina, Inc. by Dr. Dennis Bryan Fox, Medical Class of 1935, of Elkin, North Carolina, in memory of his uncle, Dr. Dennis Luther Fox, who practiced medicine for over fifty years in Randolph County. According to the donor, "the recipient of the scholarship should be a resident of North Carolina, of good moral character and should have manifested satisfactory scholastic ability."

The Dr. William Hunt Hall Memorial Scholarship was established in 1959 by the will of the late W. Hunt Hall, Jr., of New York City, in memory of his father, Dr. William Hunt Hall, Medical Class of 1855, a Confederate veteran and a practicing physician of New York City. According to the provisions of the bequest contained in Mr. Hall's will, "the trustees are directed to allocate the income from the principal, to be used by the said Trustees of The University of North Carolina at Chapel Hill for the medical education of worthy students who, in their judgment, are in need of financial assistance."

The John D. Idol Memorial Scholarship Fund was established in 1976 through the bequest of John D. Idol of the class of 1934. The funds are to be awarded to worthy students in the School of Medicine and the School of Religion.

The Mrs. Augustus H. Jones Scholarship was created in 1930 by Mrs. James H. Parker of New York City. The recipient of this scholarship is to be designated by Mrs. James H. Parker during her lifetime, and thereafter upon the recommendation of the New York Chapter of the United Daughters of the Confederacy. Failing this recommendation from either source, appointment is to be made by the President of the University, preference being given first to the relatives of the late Dr. James H. Parker of New York, and second to the relations of the donor.

The James Craig Joyner Foundation Scholarship Fund was created in 1961 by a gift from the James Craig Joyner Foundation of New York City; the fund was significantly increased by a second gift from the James Craig Joyner Foundation in 1972. Dr. James Craig Joyner enrolled in the University from Princeton, North Carolina, and entered the School of Medicine of the University in 1914.

The Sarah Graham Kenan Scholarship Fund was established in 1975 to honor the memory of Sarah Graham Kenan of Wilmington, North Carolina and to provide financial assistance to worthy students in the School of Medicine.

The Kennedy Scholarship was established in 1960 with the help of Dr. Edward C. Curnen, Jr., former Professor of Pediatrics in the School of Medicine, from a bequest by the late Robert S. Kennedy, an old family friend of Dr. Curnen. The scholarship is awarded annually in memory of Mr. Kennedy's sister, Margaret Jane (Kennedy) Osborne; his brothers, Maxwell Kennedy and Robert S. Kennedy.

The Lock Fund Scholarship was established in 1985 to provide scholarships to medical students with preference given to Guilford County residents who have an interest in Pediatrics.

The Dr. W. Lunsford Long Jr. Scholarship was established in 1963 through contributions from many of his friends, in memory of the late Dr. Long, Medical Class of 1942. Dr. Long was a practicing physician in Raleigh, and a member of the faculty of The University of North Carolina School of Medicine.

The Dr. John A. Lowder Memorial Scholarship was created in 1961 by Mr. and Mrs. S. Ray Lowder, of Lincolnton, North Carolina, in memory of their son, Dr. John A. Lowder, Medical Class of 1956. The income from the Memorial Fund, established within the Medical Foundation of North Carolina, Inc., by Dr. Lowder's classmates, friends, and family, is used for annual scholarship to a deserving and needy student in the School of Medicine.

The L. P. McLendon Scholarship was established in 1968 through a bequest from Major L. P. McLendon, Law School Class of 1912, and gifts received by the Medical Foundation of North Carolina, Inc., in memory of Major McLendon. The income is awarded yearly to a deserving medical student, preferably from the Counties of Durham, Guilford, Orange, or Anson.

The Charles S. Mangum and Charles S. Mangum, Jr. Scholarship was established from the estate of Charles S. Mangum, Jr. in accordance with his will dated November 15, 1972. One-half of new income from this trust shall be used for scholarships by the School of Medicine, and the remaining half shall be used for scholarships by the School of Law.

The Isaac Hall Manning Scholarship Fund was established by John T. Manning, Dr. Isaac H. Manning, Jr., and Howard E. Manning, Alumni of The University of North Carolina, in memory of their father, Dr. Isaac Hall Manning, Medical Class of 1895 and Dean of the Medical School from 1905 to 1933. The Fund was significantly increased in 1974 by a gift from the Sarah Graham Kenan Foundation. The income from the fund is awarded annually to a student in the School of Medicine of The University of North Carolina on consideration of scholarship and need.

The C. Knox Massey Medical Scholarship was established in 1964 by Mr. C. Knox Massey, Undergraduate Class of 1925, in memory of Mr. Massey's father, C. W. Massey, Undergraduate Class of 1888, and Mr. C. T. Council, Pharmacy Class of 1907. The Scholarship is awarded to a worthy medical student, preferably from Durham County.

The George Holliday McLeod Scholarship was established in 1983 by members of the McLeod family in memory of George Holliday McLeod. The funds are to be awarded to a deserving entering medical student who is committed to study at The University of North Carolina School of Medicine.

The Minority Presence Grant Program for Doctoral Study provides stipends of up to $9,000 for the academic year, with an option of additional support for study in the summer session, for black residents of North Carolina who are selected to participate. Recipients must be full-time students pursuing doctoral degrees at The University of North Carolina at Chapel Hill.

The Minority Presence Scholarships are granted from funds allocated by The University of North Carolina for the purpose of assisting needy black students at The University of North Carolina at Chapel Hill. Under the Board of Governors General Minority Presence Grant Program, black students may be eligible for special financial assistance if they are residents of North Carolina, enrolled for at least three hours of degree credit coursework, and demonstrate financial need.

The North Carolina Academy of Family Physicians Memorial Scholarship Fund. Funds are available to make loans and a limited number of scholarships to help defray educational expenses of worthy medical students selected by the trustees of the fund. Preference is given to those students who have demonstrated an interest in pursuing a career in Family Practice.

Any student enrolled at an accredited medical school located within the State of North Carolina is eligible to make application to the Trustees, requesting financial assistance in meeting educational expenses incurred in the continuance of his or her medical education. The Trustees will review all such applications and select the recipients. Inquiries should be directed to the Executive Director, North Carolina Academy of Family Practice, 1002 Wake Forest Road, Raleigh, North Carolina 27604.

Dr. William Jennings Bryan Orr Memorial Scholarship was established in 1977 from contributions and gifts from various donors in memory of Dr. William Jennings Bryan Orr who attended the School of Medicine from 1915 to 1917. The scholarships are for pre-med or medical students preferably from eastern North Carolina.

The John R. Paddison Student Aid Fund was established in 1967 by a bequest from Dr. John R. Paddison, Medical Class of 1900, as an expression of appreciation to the members of the Medical School faculty of The University of North Carolina, and particularly as an expression of high regard for Dr. Richard Whitehead, Professor of Anatomy and Dean of the Medical School from 1890 to 1905, and Dr. Charles S. Mangum, Professor of Anatomy and Dean of Medical School from 1933 to 1937. The income from the fund is awarded yearly as a scholarship to a medical student who is in need of financial assistance and is a resident of North Carolina.

The Parker Scholarship was established in 1930 by a gift of Mrs. James Henry Parker, through the James Parker Chapter of the New York Division of the United Daughters of the Confederacy, in memory of her husband, the late Dr. James Henry Parker. The award is made annually upon recommendation of Mrs. Parker during her lifetime, and thereafter upon recommendation of the New York Chapter of the United Daughters of the Confederacy. In default of a recommendation from either of these sources, the President of the University may designate the recipient.

The Dr. Oscar L. Sapp Memorial Scholarship Fund was established in 1981 in memory of Dr. Oscar L. Sapp, Class Advisor, by Drs. F. Daniel Jackson and Elizabeth H. Jackson of the Medical Class of 1973. This scholarship is awarded to a rising fourth year medical student who has completed the clinical work of the third year, and who also has demonstrated financial need.

The Dr. Eli R. Saleeby Fund was established in 1966 by Dr. Saleeby, Medical Class of 1920. The income from the fund may be used at the discretion of the Dean for student aid.

The Sigmund Sternberger Scholarships were established in the School of Medicine of The University of North Carolina in 1970 in the form of an annual gift from the Sigmund Sternberger Foundation, Inc., of Greensboro, North Carolina. The late Sigmund Sternberger was a prominent industrialist associated with Cone Mills Corporation, and engaged in textile manufacturing in Greensboro. He was one of the leaders in the civic, religious, and cultural activities of Guilford County and was deeply devoted to assisting persons in the community who, but for his help, would not have otherwise been able to realize their full potential. The scholarships are awarded to deserving students who are residents of North Carolina, and who are genuinely interested in practicing medicine in the state.

Louis Nelson West and Betsy John Haywood West Scholarship Fund was established under the will of Betsy John Haywood in 1976 to be used for scholarships for a person or persons attending the Medical School, or for a person majoring in the field of mathematics at The University of North Carolina at Chapel Hill.

The Dr. Thomas Woodfin Sumner Memorial Scholarship Fund was established through a bequest by Mrs. Grace A. Sumner, who died August 19, 1973, in memory of her husband, Dr. Thomas Woodfin Sumner, of Hendersonville, North Carolina. He attended the School of Medicine from 1906 to 1908, and dedicated 50 years of his life to the practice of medicine.

The Dr. John Cotton Tayloe Scholarship. Bearing the name of the loyal alumnus, Medical Class of 1920, active Trustee and long-time friend of the University of North Carolina, this scholarship was made possible by a bequest to the Medical Foundation of North Carolina, Inc. by Dr. Tayloe and was awarded for the first time in 1964.

The Adam Thorp Memorial Scholarship was established in 1960 in memory of Dr. Adam Thorp, Medical Class of 1919, of Rocky Mount, North Carolina, by a group of his friends in eastern North Carolina through contributions to the Adam Thorp Memorial Fund of the Medical Foundation of North Carolina, Inc. Dr. Thorp was president of the Alumni Association during the period 1956–57. The scholarship is awarded to worthy students of medicine in financial need.

The Dr. Hillory M. Wilder Scholarship Fund was established under the will of Mrs. Celeste W. Blake in memory of her father, Dr. Hillory M. Wilder of Charlotte, North Carolina, Undergraduate Class of 1846. Beginning in 1963, the income from this endowment has been used for scholarships to aid students in need of financial assistance in the pursuit of study for the medical profession. The dominant purpose in awarding these grants is to "produce the greatest benefit in the advancement of the science of medicine among residents of North Carolina and the alleviation of human suffering in North Carolina."

SCHOLARSHIPS AND FELLOWSHIPS BASED ON MERIT

The W. Reece Berryhill Scholarship was established in 1964 by The University of North Carolina Medical Parents' Club to honor Dr. W. Reece Berryhill, Medical Class of 1925, and Dean of the School of Medicine from 1941 to 1964. This scholarship is a merit award given to a rising senior student, and is based on excellence of academic performance since entering medical school.

The Thomas Collum Butler Scholarship was established in 1982 in honor of Dr. Thomas C. Butler's distinguished service and research career at this University. The scholarship will be used to support candidates in the combined M.D./Ph.D. program. The primary basis for making an award includes merit and potential, rather than need. Recipients of the scholarship will be selected by the Director of the M.D./Ph.D. program with the advice of the Director's Advisory Committee. The scholarship provides a stipend of $5,000, in addition to $1,300, to off-set in-state tuition and fees, or partially to offset out-of-state tuition and fees.

The Edwards Distinguished Scholarship was established in 1983 by members of the Edwards and Hobgood family. This scholarship is based on academic merit and provides support for four years. Continuation of this scholarship is dependent upon satisfactory academic performance.

Dr. Herbert H. Fritz Special Merit Award Fund was established in 1983 by the widow of Dr. Fritz in his memory. This award is based on academic merit and will be awarded each year to a medical student.

The Howard Holderness Fellowship Program was established in October, 1980 by the Howard Holderness family to provide outstanding medical students with an award that would serve as an incentive and career shaping factor at a stage in their career when they are still uncommitted. The awards will support research effort and scholarly work of the student, and in addition, will be used to cover the cost of travel to other institutions for the purpose of broadening his/her scholarly activities, or for presentations of the results of his/her studies. Under special circumstances, the award might be used to purchase laboratory supplies or small items of equipment to support the specific research program of the student. Six students will be selected yearly, and each individual award will be $3,000.00. Financial need is not considered. Recipients will be eligible to reapply for renewal on an annual basis. Nominees will be selected by a screening committee appointed by the Dean of the School of Medicine, and final selection will be made by the Holderness Fellowship Committee.

The University of North Carolina Medical Alumni Loyalty Fund Scholarships. A limited number of these scholarships has been made possible through gifts from alumni and friends of the School of Medicine.

The Riggins Scholarship was established through a gift to the Medical Foundation of North Carolina, Inc., by Dr. and Mrs. H. McLeod Riggins, of New York City, to honor Dr. Riggin's younger brother, the late Dr. John C. Riggins. Dr. H. McLeod Riggins was a member of the Class of 1922 of the Medical School of the University of North Carolina. This scholarship is a merit award given to a rising junior student and based on excellence of academic performance since entering medical school.

The Student Stores Scholarships were established to recognize academic merit for honors received in Medical School without regard to financial need. As awards are made, all funds must be considered to comply with federal requirements.

The Isaac M. Taylor Scholarship was established in 1971 by the University of North Carolina Medical Parents' Club to honor Dr. Isaac Montrose Taylor, Dean of the School of Medicine from 1964 to 1971. The scholarship is awarded annually to a medical student on the basis of merit and need.

Womack-Whitson Foundation Scholarships were established in 1983 to provide payment of tuition for four years, for two students each year, at the University of North Carolina School of Medicine. The recipients are selected by the Womack-Whitson Foundation. Continuation of the scholarship beyond the first year depends on the maintenance of an acceptable record of performance in the medical school.

Student-Faculty Relations

The Medical School is noted for its informal, friendly atmosphere. Students and faculty work together in collegial relationships through the small group teaching in Introduction to Medicine and other courses in the first two years, through research projects, through the advisory system, and in the small rotational groups established in the clinical settings. Advanced students help to teach skills in the physical examination to beginning clinical students. Student preceptors contribute to the small groups in the Transition Course. In addition, students are encouraged to participate in many School functions. Students give tours to prospective applicants and serve on the School committees such as the Admissions Committee and the Educational Policy Committee. The Student-Faculty Advisory Council was established several years ago to consider problems shared by students, faculty, and administrators. In 1986 the Council was merged with the Student Advisory Committee to form the Student-Faculty Advisory Committee, co-chaired by the Associate Dean for Student Affairs and President(s) of the Whitehead Society.

Advisory System

Each student is assigned to a faculty advisor when he or she enters medical school. The student stays with this advisor throughout medical school. The student:advisor ratio averages 6:1. Approximately 99 faculty members are presently participating in the advisory program.

Among the functions of an advisor are:

1. To be a role model for the professional and academic development of the student;
2. To give personal and academic counseling, and to direct students to appropriate resources, if the advisor cannot directly help.
3. To provide a link between the student and the administration where the advisor's personal knowledge of a student's special needs or talents can further the student's interests;
4. To serve as an advocate for a student when decisions about him or her are being made in areas such as academic promotion or awards;
5. To contribute to the letter of evaluation that is prepared by the Dean's Office for residency positions, if a student so desires.

In addition, when planning for the fourth-year, each student selects an advisor who represents his or her career goals. The student's total electives program for the fourth year must be approved by this advisor, who also assists the student with the residency application process.

The Whitehead Medical Society

The medical student body was organized into the Whitehead Medical Society in 1908. The Society's name honors Richard H. Whitehead, M.D., whose standards and leadership as Dean established the reputation of the School. A governing body of elected officers, representatives, class presidents, and presidents of student organizations is called the Whitehead Council. The Society sponsors Freshman Orientation (orientation for the entering class), Student-Faculty Day, Student Research Day, the Whitehead Lecture, and various symposia and social activities throughout the year. Student participation in curriculum review, admissions and many other ongoing activities within the School is encouraged through the Whitehead Society, which also serves as a forum for student concerns. The Society maintains its own Honor Court. A close relationship with the faculty and administration, strong bonds of fellowship and individual adherence to a high standard of integrity, social conscience, and academic excellence have always been characteristic of students acting as the Society.

Associations

There is a great diversity and strength of student involvement in national, state and local organizations at the UNC School of Medicine. Our students have traditionally demonstrated a high level of motivation and commitment to both the broad issues of national health care, as well as the problems that confront the local communities of North Carolina. A substantial number of students annually volunteer their time and services to a variety of associations and groups that: 1) increase their awareness of national, state and local health care issues; 2) cultivate professional beliefs and ethics, health and well-being; 3) encourage cooperative participation in the educational process, and; 4) provide service to the people of North Carolina through various local clinics, nursing homes and health care facilities. Some of these associations are listed here.

WOMEN IN MEDICINE

Women in Medicine is organized primarily by first and second year medical students. It has three broad goals: to sponsor events of interest to both men and women in the area traditionally known as "women's issues"; to address the range of opportunities and problems encountered in a medical career, and; to provide opportunities for medical students to meet women on the clinical and research faculty, in residency and fellowship programs, and in the general medical community.

Recent events have included panel discussions entitled "When an assault victim is your patient. . .", "Perspectives from private practice (OB/GYN)," "Having it all: balancing medicine and family."

NORTH CAROLINA STUDENT RURAL HEALTH COALITION (NCSRHC)

The NCSRHC includes students from UNC-CH, Duke University and East Carolina University, representing medicine, nursing, public health, law, social sciences, and the humanities. The Coalition merges these disciplines into programs designed to address the development of rural populations, to promote a broad definition of health, and to familiarize students with rural concerns.

Students and faculty at UNC staff a monthly clinic in the poor eastern NC community of Bloomer Hill. The clinic, which is jointly coordinated with the local Citizens' Council, offers primary care, lab services, and health education in the Bloomer Hill Community Center at no charge. In addition to providing much needed services, the clinic allows community members to gain medical skills and experience, and gives them a voice in decisions about the care received. Students have the opportunity to apply formal educational training to the actual needs and realities of rural North Carolina.

STUDENTS TEACHING EARLY PREVENTION (STEP)

STEP, Students Teaching Early Prevention, is a program run by first and second year medical students. It is designed to educate young people about what they can do now to help them maintain their own health. The focus of the program is the prevention of atherosclerosis through the management of life-style habits such as diet, exercise, control of hypertension, and the use and abuse of alcohol, tobacco and drugs. In the fall, approximately four one hour informational meetings will be held. In early February, for two days, the members of STEP visit area junior high schools to talk with seventh graders about the dangers of atherosclerosis and ways to prevent it. STEP provides an excellent opportunity for students to use some of the information learned during the first semesters of medical school through the interactions with the students. Students interested in participating during the next year should listen for announcements in August.

STEP ON AIDS

In the summer of 1988, STEP formed a new organization designed to educate people on AIDS and HIV. The program takes a non-moralistic approach to the subject, teaching factual information about the transmission of HIV and development of AIDS, and appropriate, rational means of reducing individual risk.

The program is now available for presentation to any interested group or organization. Students involved with STEP on AIDS will present the information and attempt to answer any questions the group may have. Announcements will be made in the fall for any students who are interested in participating.

THE STUDENT HEALTH ACTION COMMITTEE (SHAC)

The SHAC Clinic is the oldest student-run free healthcare clinic in the country. It was started in 1968 through the cooperative efforts of members of the community, health care professional students and faculty. The goals of the clinic are two-fold: 1) to provide at no cost basic medical and dental care for the indigent populations of Chapel Hill and Carrboro, and; 2) to provide an interdisciplinary educational experience for students of medicine, dentistry, nursing, public health and others in an unique health care delivery project. First year medical students will have the opportunity to interview patients, do basic laboratory work and observe physical exams performed by fourth year medical students, as well as plan and carry out special projects such as hypertension screening clinics. Medical faculty in the Department of Family Medicine are preceptors to the medical students. For more information watch for announcements at the beginning of the year.

GERIACTION

GERIACTION is a group of first and second year students who are interested in learning about how to care for the elderly in the nursing home, hospital and home settings. The primary activity of this group is to attend rounds once each week with a geriatrician as s/he visits a local nursing home.

GERIACTION provides an unique opportunity for first and second year students to engage in a socratic learning experience more typical of the later clinical years. Past participants have found these weekly visits to be particularly rewarding as they afforded a friendly, low pressure environment which fostered the integration of basic science concepts with those of clinical medicine. In addition to weekly rounds, GERIACTION has in the past sponsored workshops and conferences dealing with the social and cultural issues relevant to the aged and the aging process. The group is informal and encourages people to come whenever their schedule allows.

THE CHRISTIAN MEDICAL SOCIETY (CMS)

The Christian Medical Society (CMS) is a national organization of medical, dental, and allied health professionals and students who together seek to understand all aspects of medical practice from a Christian perspective. The UNC chapter of CMS actively pursues this goal by providing an avenue to fellowship, group study, open discussion, and service. Activities include weekly luncheon meetings featuring different speakers and topics for discussion, small group study sessions, weekend retreats, patient visitations, etc. Commitment to the local or national CMS organization is not required for participation in any of these projects. Activities of the local chapter are open to any interested medical or allied health student or professional regardless of race, color, religion, or nationality.

FAMILY PRACTICE INTEREST GROUP

This organization is an excellent way to gain exposure to and about family medicine. It is composed of interested students from all four classes; there are no dues or fees, interest is the only prerequisite. There are four meetings a year with topics and speakers concerning family medicine, as well as information about state and national gatherings. The last meeting of the year is given by the Family Medicine faculty who discusses procedures for applying to Family Practice Residencies across the South and the nation. The nuts and bolts of the application process are discussed, and an opportunity to meet faculty from N.C. programs are provided. The club also organized an introduction to the physical examination for first year students and this has been very beneficial for those doing MECO projects. This is done in cooperation with the Department of Medicine. Club meetings will be announced well in advance. Advisor for the Family Practice Club is Dr. Gregory Strayhorn, Office of Academic Affairs, CB 7000, 137 MacNider Bldg., School of Medicine, University of North Carolina, Chapel Hill, NC 27599-7000 (919-966-4017).

CROP LUNCH

Once a week there is an alternative to the normal Osler or Hospital Cafeteria lunch fare — CROP Lunch. With a dollar donation you can eat a simple lunch of beans and cornbread and at the same time share some of your resources with other people around the world in need. All of the money donated goes directly to CROP, an international hunger relief organization. Occasionally there is a brief presentation on some hunger related issue, but mostly the lunch is just an informal gathering of students, faculty, and others from in and around the hospital. For more information about time, place, and CROP look for signs around Berryhill.

CAROLINA GAY ASSOCIATION (CGA)

CGA sponsors support groups, programs, socials, a library, and publishes the *Lambda* Newsletter.

INTERNATIONAL HEALTH FORUM (IHF)

This group recognizes that the practice of medicine and public health is not limited to Middletown, USA. The IHF acknowledges a health-care neighborhood that is far more expansive than many specialties and sub-specialties of medicine itself. The IHF is here to remind us of the vast realm of health care that knows no limits—geographic, cultural, socio-economic, ethnic, or otherwise.

MEDICAL ALUMNI ASSOCIATION

Graduates of the UNC School of Medicine (both M.D. and basic science graduates), former housestaff of the University of North Carolina Hospitals, and faculty are automatically members of the UNC Medical Alumni Association. The Association meets annually in the spring and the fall, and holds other meetings throughout the year. There are no membership dues. The Medical Alumni Association and the Office of Medical Alumni Affairs are in the midst of major new initiatives to support the alumni and the institution.

The *Medical Alumni Bulletin* is published on a quarterly basis and serves as a means of communicating with the alumni. This publication, several student scholarships, sponsored student activities, and other activities of the School and the Association are possible through contributions to the Medical Alumni Loyalty Fund. The Loyalty Fund is held in trust by the Office of Medical Alumni Affairs.

Dr. William E. Easterling, Jr., Associate Dean for Continuing Medical Education and Alumni Affairs, is responsible for the administration of the alumni office. The office is also staffed by an Executive Assistant and is located in CB 7000, 231 MacNider Bldg., School of Medicine, University of North Carolina, Chapel Hill, NC 27599-7000 (919-962-2118).

AMERICAN MEDICAL STUDENT ASSOCIATION (AMSA)

Membership in the University of North Carolina Chapter of the American Medical Student Association is available to medical students on a voluntary basis. AMSA is a national organization which is extremely active in all aspects of student involvement in the field of medicine. The local chapter works in close conjunction with the Whitehead Society in order to give the student not only a feeling for the local problems involved in medical practice, but also an understanding of many of the same problems on a national, or even a worldwide level.

STUDENT NATIONAL MEDICAL ASSOCIATION (SNMA)

The Student National Medical Association was established in 1964 as an affiliate of the National Medical Association. The University of North Carolina Chapter was founded in 1971. Membership in SNMA is voluntary and does not supplant any other organization. The local chapter is involved with issues of specific interest to black students. The organization and the Medical School sponsor the Annual Zollicoffer Lectureship that recognizes black presence in the Medical School. In this role, close liaison is maintained with the Whitehead Society and the AMSA. Members of the SNMA may also be members of these latter student organizations, providing a wider opportunity for understanding of local and national health problems.

AMERICAN MEDICAL ASSOCIATION (AMA)

Membership in the AMA chapter of UNC is on a voluntary basis. Once a student joins the AMA, he/she becomes a member of the AMA on the county, state, and national level. Students can choose to become active at any, or all of the levels. Activities of the UNC AMA are extensive and include educating all students concerning legislation that may affect students and the future practice of medicine. Benefits are numerous, including journals, insurance, newsletters, and local as well as national meetings. AMA members interact with all other student groups, including AMSA, SNMA, and the Whitehead Society.

JOHN B. GRAHAM STUDENT RESEARCH SOCIETY

The John B. Graham Student Research Society was established in 1984 to recognize and promote student research at the University of North Carolina School of Medicine. By vote of the Whitehead Society, and with the approval of the Faculty of the School of Medicine, this society was named in honor of John B. Graham, a dedicated member of the Department of Pathology who has taken a personal interest in student research over the course of his career. The students are inducted into the society by two routes. Any student presenting a paper on Student Research Day in mid January is automatically inducted into the society. In addition, papers may be submitted by March 1 for judging by the Faculty Advisory Committee. Students will be notified before the end of March for their acceptance into the Society. Activities of the Society include meetings throughout the year by students conducting research to exchange ideas and share their experiences. In addition, the Society serves to promote liaisons between the faculty and students so that students may develop productive programs of research for the summer. It is the sincere desire of the Faculty of the School of Medicine to stimulate investigation on the part of our students and thereby promote an interest in research. We believe this Society will help achieve that goal.

Lunch-time talks by local faculty and student international health care enthusiasts, complemented by occasional forums on a given area of interest, take participants as far away as the Himalayas of Nepal, the other side of the Iron Curtain, and even our own back yards. Topics of discussion have included maternal and fetal care in the Third World as well as the Western World, health care delivery to the Native American Indians, and a comparison of current Russian and American Health issues. Future possibilities are limited only by participant interest and ideas. The Forum is informal and encourages all faculty and students alike to participate.

POSIMS-PARTNERS OF STUDENTS IN MEDICAL SCHOOL

Formerly known as the Medical Partners Association, POSIMS is a support and informational group for partners (spouses or significant others) of medical students. For more information, please contact the Medical Alumni Office (Stephanie Stadler), CB 7000, 231 MacNider Bldg., School of Medicine, University of North Carolina, Chapel Hill, NC 27599-7000 (919-962-2118).

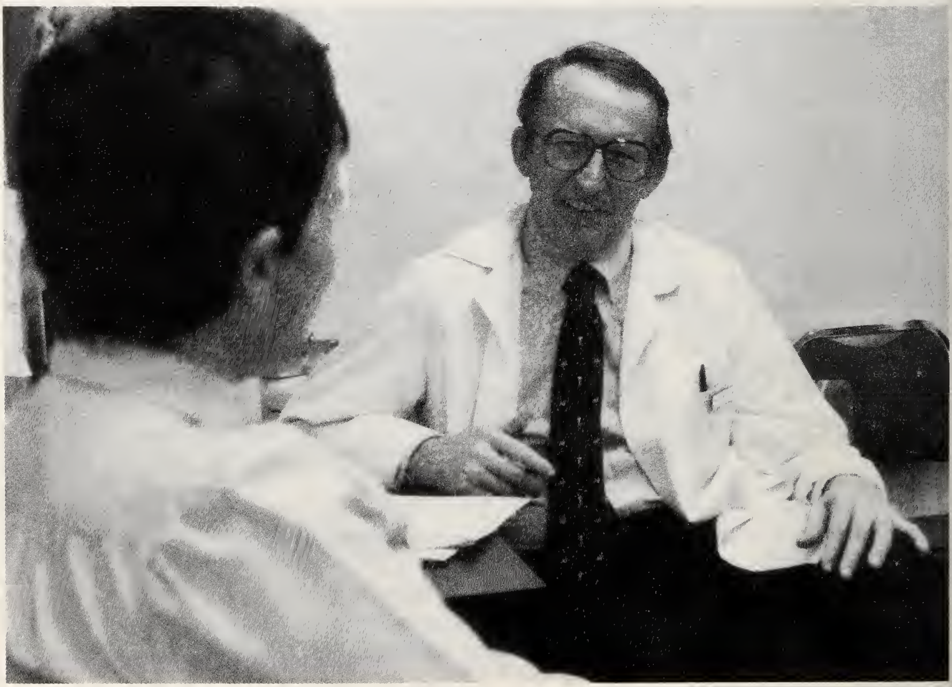
MEDICAL EDUCATION COMMUNITY ORIENTATION (MECO)/FAMILY PRACTICE PRECEPTORSHIPS

With an ever-increasing interest in primary care and rural practice, this project fills the void that exists in the first three years of medical school. It allows a student after one year of basic sciences to observe "in the field" with a family physician for a period of four to eight weeks. Elective credit or stipends are available. The project, originally organized by UNC AMSA, is now administered and funded by the UNC Department of Family Medicine. Contact Ms. Salli Benedict, Department of Family Medicine, CB 7595, School of Medicine, University of North Carolina, Chapel Hill, NC 27599-7595 (919-966-3711). (NOTE: Upper-classmen who have participated are also excellent sources of information).

THE ZOLLICOFFER LECTURE

The Lawrence Zollicoffer Lectureship was established in 1981 in commemoration of 30 years of minority presence at the University of North Carolina at Chapel Hill School of Medicine. It was named in honor of Dr. Lawrence Zollicoffer, the fourth black graduate of the UNC School of Medicine, because of his excellent academic achievement as a student at UNC. He was one of the founders of the Garwyn Medical Center in Baltimore, Maryland, where he practiced pediatrics for ten years. The Baltimore community recognized

Dr. Zollicoffer as a supporter and activist in the struggle for civil and human rights. In honor of the outstanding contributions of Dr. Zollicoffer, the Zollicoffer Committee serves to perpetuate excellence in the area of medicine for minorities.



The Academic Program

THE MEDICAL CURRICULUM

After a three year period of review in which over 300 students and faculty participated, a new curriculum was approved by the faculty in the spring of 1983. The Class of 1988 was the first to graduate from the new curriculum.

Teaching and learning are essentially human activities and involve day-to-day interactions between faculty and students as they teach and learn from each other. The curriculum provides one environment within which these interactions take place. An overall goal of the new curriculum is the fostering of the excitement, enthusiasm, curiosity, and mutual respect that characterize these interactions at their best.

Some of the principles that shape the new curriculum include:

- students should be presented with that quantity of facts and concepts that a medical student can reasonably be expected to learn and retain. Not everything can be learned in four years.
- students should be encouraged to be more active in and responsible for their education.
- the four year curriculum should be coordinated, open to change, and well managed.
- excellence in teaching should be fostered and rewarded.
- the evaluation system should certify competence, reward excellence, and help to create habits of life-long learning and self-assessment; examinations should not become ends in themselves.

Many concepts of the new curriculum reaffirm and strengthen principles and goals of the Faculty as expressed in its Policy Statement (page 3). Dean Bondurant has described the product of the curriculum review in these words:

> The recommendations are intended to strengthen the ancient bases of medical education in science, humanism and practical application modulated to be responsive to the personal, social and scientific settings of the next several decades. The recommendations include a reaffirmation of our commitment to be educationally supportive of a heterogeneous and representative student body, prominently including members of minority groups. The changes are designed to assure continuing evolution and adaptation of the curriculum in response to changes in society and in health care. The faculty has approved a solid, substantial advance in curriculum design which will doubtless help our graduates to be better doctors in the 21st century.

RESEARCH AND ACADEMIC ENRICHMENT

The School of Medicine strongly encourages students to carry out research during their medical education. Students should consider delaying graduation by one or two semesters so they can devote full time to research. A high percentage of students do become involved in research while in medical school, through such means as research electives and summer projects. Students may register for Research 399 when doing research over an extended period. A distinguished group of more than 100 faculty are available to help students develop and carry out projects using the facilities of their laboratories. Listed below are some of the research activities and programs that are available for students.

NIH Sponsored Student Research Program is directed by Dr. Arthur Finn (Medicine). Under Dr. Finn's directorship, short term funding is provided through Federal *NIH short-term training and Basic Science Research Grants* which are awarded to the School. An application to the short-term training grants and a partial list of faculty members who work with student researchers can be obtained in the Office of Academic Affairs, CB 7000, 132 MacNider Building, School of Medicine, University of North Carolina, Chapel Hill, NC 27599-7000.

The Holderness Fellowships, supervised by Dr. John Sessions (Medicine) support student research efforts. The fellowship is designed to encourage students to choose from a broad range of topics and to work with a faculty member on a scholarly project. Approximately ten to twelve students will be selected yearly and each individual award will be $3,000. Financial need is not considered. Recipients will be eligible to reapply for renewal on an annual basis.

Student Research Day: Each year approximately 30 students formally present their findings at Student Research Day, a program organized primarily by students, under the aegis of the Whitehead Society. Students present their research either in poster form, or an oral presentation. Judges award prizes for the best research presentation in each group. Each year an outstanding scholar is invited to come to Student Research Day to comment on the individual projects, and to present a talk to students and faculty. Recent speakers have been Drs. Alvin Feinstein, David Kipnis, A. McGehee Harvey and James F. Glenn.

John B. Graham Student Research Society: All students who participate in Student Research Day are inducted into the John B. Graham Student Research Society by submitting a manuscript of their research to the Faculty Advisory Committee, with Dr. Harold Pillsbury (Surgery) as faculty advisor. The John B. Graham Student Research Society was established to recognize and promote student research at the UNC School of Medicine. It is an honorary organization composed of students who have actively participated in either basic science or clinical research during medical school. The Society's objective is to promote research as an integral part of the medical education experience. The Society is currently evolving as an active part of the medical community. Meetings are held throughout the year for students to exchange and share ideas and experiences. Research endeavors are encouraged and fostered through liaisons between faculty and students.

Student Research Publication FAX: *FAX* is a journal of student research published each spring by medical students at the UNC School of Medicine. The journal features original investigations, review articles, case reports, commentary, and special reports written and edited by students. Medical students are first authors on all articles that appear in *FAX*. The editors of *FAX* change annually and work with Dr. Gregory Strayhorn (Assistant Dean for Academic Affairs) as administrative advisor and Dr. John Parker (Medicine) as faculty advisor.

Student Research Paper Program: Students at all levels in the School of Medicine are encouraged to engage in research as a significant means of enriching their study of medicine and to submit for consideration for awards, papers based upon their research. Three awards are administered by the School of Medicine, and papers may be entered in such national competitions as the Galveston Student Research Conference and the National Foundation Merit Award. The research should be conducted under the guidance of a faculty preceptor and may be laboratory or clinical research, or an appropriate combination of the two. Investigative work done in collaboration with a preceptor may be reported, but the work presented in a student's paper must be the sole work of the student; the student's paper should be submitted prior to a co-authored publication. Joint student authorship of papers based upon collaborative student investigation is acceptable and such papers are eligible for awards. Selection of an area of investigation and preceptor may be made at any time during the student's career as a medical student. The Student Research Paper Committee is ready to assist in the selection of the preceptors. The awards, consisting of certificates and monetary prizes, include such awards as the Deborah Leary Award, the highest award, and others as funds are available. The program is administered by Dr. Arthur Finn (Medicine) and the Student Research Paper Committee.

REQUIREMENTS FOR DEGREES IN MEDICINE

Doctor of Medicine

Graduation from the School of Medicine with the degree of Doctor of Medicine is dependent upon the completion of the prescribed required and elective curriculum in a manner satisfactory to the Student Promotions Committee, acting for the Faculty.

Doctor of Medicine with Honors and Distinction

The degrees of Doctor of Medicine with Honors, Doctor of Medicine with Distinction and Doctor of Medicine with Honors and Distinction have been established and approved by the faculty of the School of Medicine. The program is implemented through the M.D. Degree with Honors Committee.

To be eligible for an **M.D. Degree with Honors** a student must meet two criteria: (1) an outstanding academic record; and (2) submission to the appropriate faculty committee of a scholarly paper of superior quality related to some aspect of medicine. The minimum criteria for eligibility will be determined at the end of the third year of medical school. The criteria for an outstanding academic record are Honors for at least one year of medical school and no course failures. The student must be the sole author of the paper. Papers may be submitted to the Committee at any time, but not later than February 1 for May graduation, August 1 for August graduation, and December 1 for December graduation.

To be eligible for an **M.D. Degree with Distinction**, a student must receive an Honors rating for all four years of medical school.

To be eligible for an **M.D. Degree with Honors and Distinction**, a student must meet 2 criteria:

(1) receive an Honors rating for all four years of medical school; and

(2) submit to and have approved by the appropriate faculty committee a paper showing original scholarship of superior quality related to some aspect of medicine or biomedical science.

Doctor of Medicine with Highest Honors

The degree of Doctor of Medicine with Highest Honors has been established and approved by the faculty of the School of Medicine. This degree is available to those who successfully complete the Distinguished Scholars Program.

The goal of the program is to produce more students who are capable of in-depth, critical, and independent thought, no matter whether they go into research, private practice or other areas related to medicine. It is our belief that students trained to practice and enjoy the rigors of scholarly thinking would serve as a resource to others and raise the quality of the efforts of those around them. From this philosophy derives our view that the independent project chosen by the student may be bench research or any other plan of study approved by the Committee. It is also in support of this philosophy that equal status is to be given to the student seminar series. To be included in this series is a wide range of topics that are controversial, of social and economic import, or in need of ethical considerations.

Near the end of the academic year, the records of the third year class will be reviewed, and applications from members of the student body will be received. Based on a review of the student's records, written recommendations from faculty and interviews with the Distinguished Scholars Committee, two to four students with the highest academic potential will be chosen along with several alternates. If any decline the invitation to participate, the alternates would be approached. Upon acceptance and for the duration of his/her fourth and fifth medical school years, a student would be recognized as a "Distinguished Medical Scholar." Awarding of the scholarships will take place at a public function. Continuation in the program depends on sustained academic excellence.

Students who are accepted into the Distinguished Scholars Program will be offered an extra year of medical school to begin after the third year. This fourth year will consist of an independent, scholarly pursuit under the close supervision of a carefully selected mentor. This scholarly endeavor may consist of laboratory, epidemiologic or other research, or a full time academic program approved by the Distinguished Scholars Committee. For that year, a scholarship in the amount of $10,000 will be offered.

In addition to the individual project, biweekly seminars will be offered that are to be devoted to topics not usually covered in-depth in the usual medical curriculum. These seminars will require rigorous student preparation and participation. Topics such as clinical decision analysis, clinical pharmacology, ethics, epidemiology, public health, statistics, government and medicine, etc. are to be included. Students may also present seminar topics of their own choosing.

The fifth year curriculum of the program will remain essentially the same as the current fourth year, with the additional requirement that the Distinguished Medical Scholars will attend and participate in the seminar series (students taking rotations at outside hospitals will be excused). For this fifth year, a scholarship in the amount of $5,000 will be awarded.

On completion of the fifth year, the student's performance will be evaluated, and, if this performance be of continued high quality, the student would be granted a Degree of Doctor of Medicine with Highest Honors. The diplomas of participating students will indicate that s/he was selected as a Distinguished Medical Scholar. If a student's performance were not of a high quality, a Degree of Doctor of Medicine with Honors could be granted.

Bachelor of Science in Medicine

Eligibility for the Bachelor of Science in Medicine degree is dependent upon: (a) admission to The University of North Carolina School of Medicine; (b) completion of specific undergraduate courses with at least the third year of preprofessional work at The University of North Carolina at Chapel Hill, and; (c) evidence of satisfactory completion of the prescribed curriculum of the first year of Medical School. This degree is awarded by the College of Arts and Sciences.

Academic Record

A complete academic record is maintained by the Office of the Dean on each student registered in the School of Medicine. Reports of performance, certifications of enrollment, and letters of recommendation are supplied upon request of the student without charge for applications for training, licensure, etc.

A student will have appropriate access to his or her record upon request with the right to challenge the accuracy of the information contained therein.

EVALUATION OF STUDENT PERFORMANCE

The students in the School of Medicine are highly selected and the expectation of the faculty is that all students who enter should be able to successfully complete the requirements for the degree of Doctor of Medicine. Certain certifying standards must be met and the evaluation system outlined below is intended to accomplish this end.

Acceptance of the regulations and policies adopted by the Faculty, described in Appendix B, is assumed with registration.

The new evaluation plan is based on the premise that the way students are examined is a major determinant of the way they study, how they learn, and their attitude toward their education. The goals of the curriculum are to build problem-solving and communicative skills and to develop habits of self-assessment and continual learning that will remain with the physician throughout his or her professional life. Examinations should reflect these broad goals of the curriculum.

The evaluation system is based on the following principles:

1. The honors, pass, fail grading system will be used in the first two years; the honors, high pass, pass, low pass, fail grading system will be used in the third and fourth year.
2. Students will be tested with a number of formats such as short answer and essay so that they can demonstrate knowledge beyond fact recall.
3. The teaching aspect of examinations will be emphasized, and the Associate Dean for Academic Affairs will monitor the curriculum for any tendency toward overexamining students.
4. Faculty-designed examinations, closely related to course content, will be used.
5. Students must pass every course; tutorials, a summer program, re-examination and a decelerated program may be options for students having academic difficulties; for advanced students, testing for exemption from selected basic science courses is offered.
6. A Promotions Committee, composed of faculty members actively engaged in teaching, will apply the standards established by the faculty and specifically expressed by the faculty in each course.

First-Year Curriculum

The first two years of medical school are the only time in the life of a physician devoted primarily to studying the scientific basis of clinical practice, and it is crucial to provide a firm biological framework for the inevitable technological changes in the future. Within this context, the majority of time in the first two years should be spent learning the science of medicine. Emphasis is given to demonstrating clinical implications and correlations. Medicine is also essentially a humanistic and caring profession, and these attitudes and skills are taught and modeled by faculty throughout, beginning in the first year. Medicine is influenced by a variety of social, cultural, ethical and economic issues, and the humanities and social and behavioral sciences are valued elements in the preclinical education of students at this medical school. The teaching of essential clinical skills begins early in the first year.

Classes in the first year will usually meet from 8:30 a.m. to noon daily. At least two afternoons a week remain free of assigned responsibilities. The number of lecture hours/day are generally limited to 3–3½ hours/day, and small group problem-solving sessions, laboratories, and clinical case conferences will provide ample opportunities for active learning and stimulating exchange with faculty members.

The clock hours listed below are representative of the 1989–90 academic year.

BIOCHEMISTRY

An introduction to the general principles of biochemistry and metabolic regulation in man and other living organisms. The topics covered include protein structure, enzyme catalysis, acid-base regulation, central pathways of intermediary metabolism, hormonal and neural control systems, expression of genetic information, molecular mechanisms of disease, and nutrition. Lectures and case conferences to be solved by student groups.

Dr. Stephen G. Chaney *138.5 clock hours*

CELL BIOLOGY

This course is designed to provide entering students with an integrated view of the organization, structure and behavior of cells. The course will cover the structure and function of cell membranes, membranous organelles, the nucleus and the filamentous components of the cytoplasm. How cells interact with each other and with the environment will be discussed. Laboratory exercises will be used to illustrate and elaborate lecture material.

Dr. Keith W. Burridge *22 clock hours*

GROSS ANATOMY

Dissection of the human body, supplemented by lectures, demonstrations and conferences. The fall semester covers all regions except the head and neck. The head and neck are covered in eight weeks of the Spring Semester.

Dr. O. William Henson, Jr. *141 clock hours*

HISTOLOGY: STRUCTURE AND FUNCTION OF CELLS AND TISSUES

The course of Histology consists of 2 hours of lecture and 3 hours of laboratory per week for the first semester. The course is an introduction to the study of the structure of cells, tissues and organs at the level of the light and electron microscopes. Emphasis is on structure-function interrelationships. Lectures are devoted to the functional morphology of cells and their organelles, chemical composition of cellular components and products, origin of specific cell types, and a histological and ultrastructural survey of the tissues and organ systems which characterize the human body. The laboratories provide the student with an opportunity to study the structural characteristics and interrelationships of normal cells, tissues and organs with the light microscope and electron micrographs. Self-instructional exercises and review sessions are also available to the students.

Dr. Michael G. O'Rand *67 clock hours*

IMMUNOLOGY

The principles of immunobiology, including molecular and cellular basis of the immune response, ontogeny, regulation, genetic control and immunoglobulin structure and function. Basic concepts are related to resistance to infection, allergy, tumor immunity, transplantation, autoimmunity and other diseases associated with abnormal immune function.

Dr. Geoffrey Haughton (1989–90) *51.5 clock hours*

Past Course Director:
Dr. Jeffrey A. Frelinger (1987–88, 1988–89)

INTRODUCTION TO MEDICINE

This one and one-half hour per week course explores the concept of physician and patient, and some of the dynamics of their interactions.

Time is spent in two ways: case presentations, which are complementary to the basic medical curriculum, and; topics that emphasize the varying medical and paramedical disciplines needed to help patients. The class is also divided into groups of eight students precepted by clinical faculty from all departments to work at the task of learning patient interviewing skills by direct patient contact, videotaping and review.

Dr. James A. Bryan II *43.5 clock hours*

INTRODUCTION TO PATHOLOGY

This is a short 10 session course designed to bridge the basic sciences taught in the first year with the clinical sciences taught in the second year. Some of the causes, mechanisms and features of common disease processes are presented in 10 short lectures followed by longer laboratory small group sessions.

Dr. J. Charles Jennette *35 clock hours*

Past Co-Course Director
Dr. Frederic G. Dalldorf (1987–88)

MEDICAL EMBRYOLOGY

The aim of this course is to provide a concise presentation of the essential facts of human embryology, clarifying the gross anatomical features without omitting recent advances or changing concepts in the basic sciences. In addition to normal developmental processes, a description of congenital malformations and their etiology will also be presented.

Dr. Thomas W. Sadler *20.5 clock hours*

MEDICAL PHYSIOLOGY

Consideration of membrane, muscle, cardiovascular, pulmonary, renal, endocrine and gastrointestinal physiology is provided in 4–5 lectures each week during the spring semester of the first year. In addition, students meet in small groups for two hours of problem-oriented analyses and laboratory exercises each week. Clinical correlations are made throughout the course to emphasize the basic functions and interactions of human organs.

Dr. David L. McIlwain *99.5 clock hours*

MICROBIOLOGY

This course is scheduled for four mornings per week during the spring semester. Lectures, lab exercises and small group discussions are used to introduce students to the study of infections caused by bacteria, fungi and parasites, and viruses. Students are exposed to the basic concepts of structure, metabolism, growth and reproduction, and genetics of procaryotes and single cell eucaryote systems. Emphasis is placed on the structural, chemical and biological nature of infectious agents, host-parasite interactions and the nature of resistance to infection, especially as these relate to prevention, diagnosis and treatment of infectious diseases.

Dr. Philip J. Bassford *119.5 clock hours*

Segment Directors:
Dr. Robert E. Johnston and Dr. Nancy Raab-Traub
Dr. Anthony E. Hilger
Dr. Roy L. Hopfer
Dr. James E. Hall

Past Co-Course Directors:
Dr. Steven Bachenheimer (1987–88)
Dr. Joseph F. Pagano (1988–89)

NEUROBIOLOGY

Prerequisites: physiology, anatomy, histology, cell biology. Required of first-year medical students.

The course is a multidisciplinary approach to the nervous system in health and disease. Structural and functional organization is analyzed at the level of the cell membrane, the neuron and integrated neuronal systems. Emphasis is also placed upon common pathological disturbances. Clinical cases are presented to illustrate anatomical, physiological and pathological points.

Course includes lectures, demonstrations, discussion groups, and laboratory exercises. Departments involved are; Anatomy, Neurology, Pathology, and Physiology. Spring Semester.

Dr. Gerry S. Oxford *77.5 clock hours*

SOCIAL AND CULTURAL ISSUES IN MEDICAL PRACTICE

Illness and healing take place in a cultural context that embraces the complexity of the human world, including historical legacy, ethical values, and changing social, economic and political forces. Through reading and seminar discussions, lectures, the writing of essays, group exercises, and the taking of a social-family history, students explore those social and cultural factors that influence how illness is perceived, diagnosed and treated. The role and responsibility of both patients and physicians in the organization and economics of health care are also emphasized.

The readings represent diverse approaches, including essays, short stories, social and economic analysis and ethical argument, among others. Students are encouraged to develop critical abilities to approach the readings and to assess the assumptions that shape current medical practices and medical education.

Most classes are conducted as seminars in which approximately sixteen students are led by a clinician and a faculty member from the social sciences or humanities. Lectures are given when appropriate.

Dr. Gail E. Henderson *43.5 clock hours*

Past Course Director:
Dr. Larry A. Churchill (1987–88)

BIOMEDICAL SELECTIVE SEMINARS

The purpose of these classes is for students to gain a better understanding of how science is made, by allowing students to select topics for in-depth study, and by engaging in stimulating discussions with a small group of students and faculty.

An average seminar size of eight students facilitates discussion and a fair distribution of student effort. Seminars therefore, frequently have upper limits of 10–12 students and may be canceled if less than 3–4 students apply. Seminars meet for a minimum of six two-hour sessions. Many other meeting formats are used, but 12 contact hours between faculty and students is a minimum. The students are expected to spend considerable time outside of class reading primary sources and preparing to lead the discussion in one of the sessions.

Students should complete the basic science courses (or have considerable prior experience) before taking a seminar in that discipline; for example, in the second semester of the first year students may select seminars in biochemistry, immunology, histology and cell biology but not in microbiology, and other second semester or full year courses. A list of the biomedical sciences seminars to be offered will be available at the beginning of each semester.

Students may substitute laboratory research or a literature review project for the selective in the biomedical sciences with prior approval by the course directors and their research preceptors.

Among the titles of previous seminars are: Neuroanatomy; Cell Biology; Reproductive and Developmental Biology; Fine Structure of Biological Material; Gross Anatomy; Biochemical Mechanisms of Anti-cancer Agents; Human Nutritional Requirements; Your Personal Nutrition; Myelin; Molecular Endocrinology; Cardiopulmonary Effects of Environmental Pollutants; Respiratory Epithelial Function in Health and Disease; Resistance to Anti-microbials in Microorganisms; State of the Art in Research in Carcinogenesis; Involvement of Blood Coagulation Mechanisms in Metastasis; Pathogenesis in Immuno-Mediated Renal Injury; Rickettsiosis: A View of Basic Science, Tropical Medicine, and Public Health; Glycoprotein Biosynthesis and Catabolism; Selected Topics in Renal Pharmacology; Neurophysiology of Pain and Endogenous Pain Control Systems; Biochemistry of the Cytoskeleton; Current Topics in Clinical Nutrition; Glycoprotein Biosynthesis and Degradation; Application of DNA Technology to Medicine; Cell-Cell Interactions; Inborn Errors of Metabolism; Immune Mechanisms in Rheumatic Disease; Physiology of Acid Base Balance; Selected Models of Infection, Immunity and Inflammation; Molecular Pathogenesis of Bacterial Infections with Emphasis on Sexually Transmitted Diseases; Research and Clinical Dimensions of Flow Cytometry; Implications of Immunology for Growth and Development of Tumors; Human Immunogenetics; Mechanisms Whereby Hormones and Neurotransmitter Occupied Receptors Alter Cell Function; Whole Body N-economy and the Urea Cycle; Protein Interactions in Blood Coagulation; Metal Metabolism and Toxicity; Respiratory Epithelial Function in Health and Disease; Red Blood Cell Structure and Function; Topics in Genetic Toxicology; Molecular Aspects of Herpesvirus Latency; The Male Reproductive System; Pharmacology of Ion Channels; Toxic Reactions of Drugs and/or Environmental Chemicals.

Drs. Dennis W. Ross and Thomas W. Traut *12–24 clock hours*

Second-Year Curriculum

Teaching is integrated and multidisciplinary within and among courses. Small group teaching and emphasis on clinical examples will continue in the second year. Classes meet from 8:00 a.m. to 12:30 p.m. daily, with some afternoon sessions.

GENETICS

The principles of human genetics as applied in medicine are taught with emphasis on practical examples that illustrate these principles.

Dr. Arthur S. Aylsworth — *26 clock hours*

Past Course Director:
Dr. Michael R. Swift (1987–88, 1988–89)

INTRODUCTION TO PSYCHIATRY

Introduction to Psychiatry meets two hours per week throughout the second year. Lectures, videotaped interviews and patient demonstrations are used to present the essentials of medical psychiatry. Current concepts of etiology and treatment of the major psychopathologic entities are considered. Sessions devoted to problems of substance abuse, psychosomatic medicine, human sexual behavior, and forensic psychiatry are included.

Dr. William E. Bakewell, Jr. — *45.5 clock hours*

CLINICAL EPIDEMIOLOGY AND PREVENTIVE MEDICINE

This course, offered by the Department of Social Medicine, includes lectures and seminars on the designs and methods of clinical investigation and their application; on preventive medicine; and on reviews of the scientific literature. Studies using cross-sectional, cohort, case-control, or controlled trial designs with quantitative methods of analysis are used to increase knowledge and skills in clinical decision-making. Quantitative methods are taught in lectures and seminars using a text. The determinants of health and disease are covered in relation to the preventive, caring, and treatment roles of medicine. Students prepare and present a review paper in response to selected clinical questions. The course is taught by an interdisciplinary faculty of clinicians and epidemiologists.

Dr. Timothy S. Carey — *39.5 clock hours*

Past Course Director:
Dr. Desmond K. Runyan (1987–88, 1988–89)

MECHANISMS OF DISEASE

This course runs concurrently with Pathology and Pharmacology, and the three courses are designed to complement each other. The major focus of the Mechanisms of Disease course is pathophysiology, that is, the functional consequences of disease. Students are encouraged to view disease processes in longitudinal perspective, and a problem-oriented approach is employed to sharpen skills in deductive reasoning. This is not a course in clinical medicine, but clinical examples are extensively employed to illustrate physiological principles. Various teaching methods are utilized, including lectures, small group discussions, laboratory exercises, clinical conferences, and opportunities for independent study.

Administratively, the course is subdivided into nine segments, corresponding to the major organ systems of the body. The content of each segment is briefly summarized below.

Dr. William E. Lassiter *315 clock hours*

Cardiovascular System

This is a systematic study of the cardiovascular system with stress on the functional mechanisms that are especially relevant to the practice of medicine. Clinical examples are extensively utilized to illustrate the effects of disease on cardiovascular physiology.

Dr. Park W. Willis, IV

Endocrine System

The objectives of the course are to learn about the physiology and biochemistry, and the consequences of disturbances in function, of the major endocrine glands in humans. Emphasis is placed on those areas of basic endocrinology that are most essential in the practice of medicine. Selected endocrine diseases will be considered as examples of endocrine pathophysiology.

Dr. H. Shelton Earp

Gastrointestinal System

Gastrointestinal, hepatobiliary and pancreatic physiology are emphasized as they relate to an understanding of clinical disorders and their functional consequences.

Dr. Roy C. Orlando

Hematopoietic System and Tumor Biology

This course provides a broad overview of the common diseases affecting the blood and bloodforming organs. An important aspect of the course is direct laboratory experience in the interpretation of blood smears and bone marrow morphology. Biological principles underlining the various types of malignant transformation of tissues, and how these relate to various therapeutic approaches, are considered.

Dr. Stephen A. Bernard

Past Co-Course Director:
Dr. Eugene P. Orringer (1987–88, 1988–89)

Nervous System and Special Senses

The fundamentals of neurobiology are briefly reviewed and the functional consequences of the more common disorders of nervous system function are surveyed.

Dr. Robert S. Greenwood

Reproductive Biology

The major anatomic, developmental, physiologic and behavioral aspects of human reproduction are surveyed. The spectrum of interest ranges from the study of individual germ cells to consideration of population dynamics and human sexuality.

Dr. Mary G. Hammond

Respiratory System

The essentials of respiratory physiology are reviewed, and the functional consequences of the major diseases of the respiratory system in children and adults are considered in detail.

Dr. Brian A. Boehlecke

Past Course Director:
Dr. Frederic L. Eldridge (1987–88, 1988–89)

Skin

This course introduces the student to the structure, function and pathology of skin and connective tissue. Stress is placed on the integration of clinical manifestations and pathology of specific disease states and reaction patterns involving skin and connective tissue.

Dr. Robert S. Tomsick

Past Course Director:
Dr. Robert A. Briggaman (1987–88)

Urinary System

The objectives of this course are to review the principles of kidney function, to provide an understanding of the factors that determine and control the volume and composition of the body fluids, and to discuss the functional implications of kidney disease. Clinical examples are extensively utilized to illustrate physiological principles.

Dr. Hillel J. Gitelman

MUSCULOSKELETAL SYSTEM

The goals of the course on the musculoskeletal system are to review the normal development, structure and function of the musculoskeletal system, along with the normal physiology and biochemistry of its tissues. The pathological conditions altering normal structure and function of the musculoskeletal system are introduced and applied to the diagnosis and treatment of musculoskeletal diseases and disorders.

Dr. Frank C. Wilson, Jr. *47.5 clock hours*

PATHOLOGY

Pathology runs throughout the second year and is integrated as much as possible with the Mechanisms of Disease course. Various teaching methods are used including lecture, small group discussion, laboratory exercises, clinical conferences, and independent study. Examinations are concept oriented and composed of short answer essay questions and case oriented problems. An autopsy exercise is included for all students and optional Clinical Pathologic Conferences (CPC's) are available.

Drs. Frederic G. Dalldorf and Stuart A. Bentley *190 clock hours*

PHARMACOLOGY

This course presents the pharmacologic basis of therapeutics. Basic principles and facts are illustrated by clinical applications presented in problem-solving sessions for small groups and the whole class. The course, however, does not emphasize therapeutics.

Dr. Barry Goz *79.5 clock hours*

PHYSICAL DIAGNOSIS

This course builds on the understanding of the doctor-patient relationship and the interviewing skills developed during the first year in Introduction to Medicine. Large group meetings are held thrice weekly for six weeks for discussion, demonstration, and practice of the physical examination. For the remainder of the year, students are divided into small groups under the direction of the clinical faculty for the study of medical history-taking, physical examination, and the oral and written patient presentation. Individual patient assignments on the medical wards are supplemented by small group sessions in the surgical subspecialties. The examination of patients during small group preceptorships may be done at AHEC locations.

Dr. Axalla J. Hoole *76 clock hours*

SEMINARS IN THE HUMANITIES AND THE SOCIAL SCIENCES

Students are required to complete one twelve week seminar in the humanities and social sciences, either during the fall or spring semester of the second year. Fifteen different seminars are taught by a variety of faculty from the School of Medicine and the College of Arts and Sciences. Each seminar explores a specific topic in social medicine, using materials from one or more of the fields of philosophy, ethics, history, literature, law, and the social and policy sciences. The list of offerings is announced during the spring of the preceding academic year, and first year students are required to register then for the seminar they intend to take the following year. Each seminar is limited to no more than twelve students and meets for 2 hours weekly. Students prepare both written and oral work for presentation and course evaluation.

Dr. Sue E. Estroff *12–24 clock hours*

Past Course Director:
Mr. I. Glenn Wilson (1987–88)

THE TRANSITION COURSE

This is a required one-week course for medical students offered between the second and third years. The course is designed as a bridge between the basic medical sciences and the applied clinical sciences and will provide an introduction to the environment, the people and the skills of the hospital. The course will consist of a series of activities and formal sessions, including an introduction to the interpretation of laboratory tests and X-rays. Students will use and apply to case problems, various sources of clinical information: they will review and summarize a medical record. They will practice their clinical reasoning skills to develop differential diagnoses through a series of case presentations completed individually and in small groups, with faculty and student preceptors providing guidance and consultation.

Dr. William D. Mattern

Third-Year Curriculum

In the third year the student rotates through the clinical services of five major disciplines: Medicine, Obstetrics and Gynecology, Pediatrics, Psychiatry, and Surgery. The student is exposed to the principles of Family Medicine during a required four-week preceptorship, which is usually taken in the fourth year. In addition to learning the content, skills and attitudes specific to each clinical specialty, students receive ongoing instruction in the many areas of clinical medicine that cut across disciplines: the social, ethical, legal, and psychological aspects of medical practice; the health care delivery system; and the practice of cost-effective medicine. Basic clinical skills such as history-taking and physical examinations are emphasized, as appropriate, in each clerkship. The AHEC centers play a major role in the third and fourth years and offer experiences in community hospitals and with private practitioners.

SURGERY (12 weeks)

During this 12 week clerkship, students participate as active and responsible members of the surgical team to which they are assigned. They study patients with a variety of surgical illnesses under the direct supervision of members of the surgical faculty. Students function as clinical clerks on various surgical services during which time their work is carefully supervised and evaluated by members of the resident and attending staff. Multiple topics related to general surgery and all of the surgical specialties are covered in the clerkship, which utilizes inpatient and outpatient facilities at the University of North Carolina Hospitals. Some students will have the opportunity to rotate on the urologic service at Danville Memorial Hospital in Danville, Virginia and the general surgery service at the New Hanover Memorial Hospital in Wilmington, NC. The clinical experience during the clerkship is complemented by lectures, seminars, conferences, small group discussions, and patient care rounds. Students are expected to study and analyze the problems presented by their patients using the available resources of the departmental personnel, hospital laboratories and Health Sciences Library. During the clerkship, students are expected to develop cognitive, manipulative and attitudinal skills as part of their continuing education in medicine in general, and with surgical diseases in particular.

Dr. Robert D. Croom, III

MEDICINE (12 weeks)

This third year course is an introduction to the life-long process of learning clinical medicine. Students undertake 3 one-month rotations in which they evaluate and follow several new patients each week. One rotation is at an AHEC hospital. Case presentations to the ward attending physicians are a regular part of the student's experience. On completion of the clerkship, students can expect to have worked up, become familiar with or participated in the care of patients with a broad range of major acute and chronic illnesses. Students are an integral part of the ward team, attending morning work rounds, attending rounds, X-ray rounds, professor rounds and noon lectures and conferences, including weekly Grand Rounds and Clinico-Pathological Conferences. Students read widely in the field of medicine, and in-depth on the problems of the patients under their care. They are evaluated chiefly on their competence in assuming patient care responsibilities, but also on general medical knowledge.

Dr. C. Thomas Nuzum

PEDIATRICS (6 weeks)

This clerkship consists of four weeks on the inpatient ward, one week on the term nursery and one week on an ambulatory rotation. A variety of pediatric problems will be encountered in these settings. In addition, there will be opportunities to explore those aspects of preventive medicine which relate directly to pediatrics. The purpose of the clerkship is to provide students with the opportunity to increase their knowledge and clinical skills in pediatric medicine. Upon completion of the clerkship, students should be able to organize and work through pediatric problems in a logical manner. In addition to patient care responsibilities, learning experiences include teaching rounds with house officers and attending physicians, departmental teaching conferences, a seminar series on important pediatric topics, and independent learning through reading and study.

Dr. William L. Coleman

OBSTETRICS AND GYNECOLOGY (6 weeks)

Students participate actively in the prenatal, intrapartum, and postpartum care of normal and abnormal obstetrical patients. They are actively concerned with the diagnosis and treatment of minor and major gynecological problems in the Outpatient Department and on the hospital wards. The clerkship may be spent in an affiliated community hospital.

Dr. William N.P. Herbert

PSYCHIATRY (6 weeks)

Students receive clerkship training in one of the teaching hospitals of the Department of Psychiatry: Dorothea Dix Hospital, John Umstead Hospital and the University of North Carolina Hospitals.

Student instruction includes extensive, closely supervised work with patients. All sites also offer seminars, case conferences and supervised reading. Each site maintains a student learning and study center with reference materials, videotaping and playback facilities, and instructional materials such as videotape programs.

The curriculum is integrated with the content of the second year course in psychiatry, and the curriculum objectives are given to all students for use in planning, organizing and guiding their study of psychological medicine. The curriculum is organized to equip the student with knowledge, skills and attitudes from this specialized area of medicine which will be useful in all medical work. Such content includes understanding of matters such as the nature of stresses, methods of adaptation, constructive use of the doctor-patient relationship, and the utility of the biopsychosocial perspective in patient evaluation and medical care.

Dr. Jeffry J. Andresen

Fourth-Year Curriculum

The purposes of the fourth year of medical school are to allow students to develop and apply problem-solving skills to clinical situations, to have varied clinical experiences and to enrich their scientific and clinical education. Students are required to take seven electives, two of which must be an acting internship at an AHEC hospital and a preceptorship in Family Medicine. Most students take more than seven electives, and many students take one or more research or nonclinical electives before the fourth year. The student selects an elective program in consultation with his or her electives advisor. Electives advisors offer guidance in the student's chosen specialty, and in the case of an undecided student, counsel the student in an appropriate general course of instruction. Elective selection is coordinated through the Office of Student Affairs of the School of Medicine under the supervision of the Committee for Elective Programs. Scheduling is done through that office; students must comply with the regulations published by the Committee for Elective Programs.

As indicated by the list of over 200 electives given below, the School offers a flexible program so that students can pursue areas of special interest and create a balanced program that best suits individual needs and career goals.

FAMILY MEDICINE PRECEPTORSHIP

Students will observe and participate in the patient care activities of selected physician preceptors in North Carolina communities. Student placement will be in practice sites associated with AHEC programs. The Family Medicine Preceptorship for senior students includes the following goals:

1. To participate in family practice, emphasizing the acquisition of knowledge and skills in the identification and primary management of common problems and ambulatory patients.
2. To participate in evaluation, education and treatment of patients and their families, utilizing knowledge of their socioeconomic psychological settings.
3. To appreciate the value of continuity of care for the doctor-patient relationship.
4. To function within the health care team in the family physician's office.
5. To participate in patient care involving medical resources within the area, including available consultants, hospitals, social agencies, public health agencies, ministers, and mental health facilities.
6. To observe basic aspects of practice management, including the medical record system, patient flow, billing and collection procedures.
7. To observe the family physician's lifestyle and the community setting of his/her practice.

The preceptor will review and evaluate the student's competence in the family practice setting and will discuss this with the student. The preceptor completes a clinical progress report which is returned to the Family Medicine Student Office. A final grade is assigned by the department and a copy of this report is filed in the Department of Family Medicine and in the Dean's Office. Students have the opportunity to select in order of preference the geographic area and time period they desire. Matching students with their first choice is not always possible since preceptor sites are limited at certain times of the year, and also, it is financially mandatory that students be assigned to the sites where housing is leased on a yearly basis. All students are required to take this course in North Carolina, and only with physicians who are on our faculty. Individual arrangements that students make with physicians will not be honored.

For more detailed information about scheduling, housing and registration, please refer to the current handbook "The Elective Program."

Listed below are the current offerings for the Family Medicine Preceptorship:

FMED 447. RICH SQUARE MEDICAL CENTER. This rotation is primarily ambulatory in nature, with a patient profile involving 65% adults and 35% pediatrics. No OB is done, and there is some experience in nursing homes. The student will work mostly in the outpatient clinic, but will have the opportunity to make hospital rounds if desired. Some minor trauma is seen, and the clinic sees approximately 25 patients per day. Call is usually one night a week and one weekend out of three or four. Drs. Jeff Burton and Raven DeLoatch.

FMED 448. MIDDLESEX. The Middlesex Clinic is a family practice affiliate of the Carolina Clinic, a multi-specialty clinic located in Wilson, North Carolina. The Middlesex Clinic itself is located in southern Nash County, one-half hour east of Raleigh. Family Medicine senior students are housed at an apartment in Wilson, and make morning and evening rounds with Dr. Torrey. The remainder of the day is spent in Middlesex. The patient population in Middlesex is evenly divided between pediatrics, adults and geriatrics. Office gynecology, minor surgery, pre-and post-natal care is provided, but no obstetrics is performed. Additional facets of the rotation include industrial medicine, nursing home care, and home visits. The call schedule is shared between a group of seven family practitioners, with an average of call every 7th night. (Middlesex is east of Raleigh and is one hour from Chapel Hill.) Dr. Torrey.

FMED 451. ROCKY MOUNT FAMILY MEDICAL CENTER. Dr. Richard Michal and Dr. John Mitchell are both board-certified in family medicine. No obstetrics is done, but 35% of the practice is pediatrics, 25% is geriatrics, and the remaining 40% involves young adult problems. Students make daily rounds with their preceptor, and present the initial evaluation and work-up. Students participate in various committee meetings, and make our presentation at grand rounds. Students do the initial screening for ER patients, and have the opportunity to interface with specialists if interested. Students take call with their preceptor, and may choose a one-half day administrative consultation. Each physician sees from 20–30 patients per day. Drs. Richard Michal and John Mitchell.

FMED 452. TARBORO/THE TARBORO CLINIC. Students assigned to the Tarboro practice will be assigned to one of two sites based on the availability of the physicians. The first site is the main Tarboro Clinic. The second site is a satellite clinic in Whitakers. The main Tarboro Clinic is a multi-specialty group. In addition to family medicine, specialties include general surgery, ophthalmology, psychiatry, OB-GYN, internal medicine, and pediatrics. Each student will be assigned to one physician, but will interact with others in the group. Each physician sees anywhere from 30–35 patients per day. Students are expected to make morning and evening rounds with their preceptor, and work with him in the admission, diagnosis, treatment, and follow-up of patients. Opportunities also exist to visit various community agencies. Dr. Ron Hughes precepts students at the satellite clinic in Whitakers located 18 miles from Tarboro. Between 35–40 patients a day are seen. The practice consists of 25% pediatrics, 50% adults and 25% geriatrics. Dr. Hughes has an interest in occupational medicine. Students assigned to Whitakers will stay in Rocky Mount. (Tarboro is located midway between Raleigh and the coast, a two-hour drive from Chapel Hill.) Students are expected to take call about every third night. Selected staff.

ORANGE/CHATHAM COMPREHENSIVE HEALTH SERVICES (OCCHS). There are three different clinics in the OCCHS system, (FMED 453, 454 and 459), which teach students and each is described below. Student assignment will be based on clinic availability. Occasionally, a student may need to spend time at two different clinics during the course of a rotation. The Moncure and Prospect Hill clinics are considered by AHEC to be "commuting sites" and therefore, travel reimbursements are limited to 8 round-trips during the rotation.

FMED 453. MONCURE HEALTH CENTER. This practice is the same as the Carrboro Health Center, (See FMED 459), except that the patient population is rural. Moncure is located in Chatham County. Drs. Thomas Miller and Todd Shapley-Quinn.

FMED 454. PROSPECT HILL HEALTH CENTER. The staff is similar to that described for Carrboro, (See FMED 459). The patient population includes a large Hispanic and migrant farm worker component. Prospect Hill is located in Caswell County. Dr. Debra Norton.

FMED 458. SILER CITY. Dr. Keith McManus, a graduate of UNC Medical School, joined the practice of Dr. F. D. White in 1988. Dr. White has been in Siler City approximately 25 years. The physicians see a combined average of approximately 50–65 patients each day. The patient population consists of 20% children, 50% adults and 30% geriatrics. No obstetrical deliveries are performed. A hospital practice is maintained at Chatham Hospital located 50 yards from the office. The physicians serve as plant physicians for Hickory Mt. Farms and Brookwood Farms, two meat packing and processing plants, and Quality Molded Industry, a plastic products plant. Dr. McManus will serve as the preceptor. Students are encouraged to participate in night and weekend call. Dr. Keith McManus.

FMED 459. CARRBORO HEALTH CENTER. The Carrboro Health Center is a federally funded clinic that has an annual patient encounter load in excess of 10,000. Staff includes physicians in family medicine and internal medicine, family nurse practitioners, and a laboratory director. A small pharmacy is located in the clinic. The practice includes health care maintenance and management of acute and chronic illnesses in children, adults, prenatal patients and geriatric patients. The patient population reflects its urban environment. Physicians are affiliated with UNC Hospitals. Students do not make hospital rounds, nor do they participate in night or weekend call. Students may be exposed to various community agencies and facilities, including mental health center, hospice and home health agency. Drs. Doug Oster and Carol Klein.

FMED 461. CHARLOTTE/NEIGHBORHOOD HEALTH CENTER. This health center, affiliated with Charlotte Memorial Hospital, is located in downtown Charlotte and is 2 miles from the hospital. The patient load, about 40 each day, is 95% black and comes mostly from a very low income population. Facilities include six examining rooms, a treatment room, lab, and X-ray. Students are encouraged, but not required, to participate in night and weekend call and are expected to attend daily hospital rounds.* Only pre-natal care is offered now as part of the practice. Other staff include three registered nurses, and an X-ray/lab technician. A car is needed at this site. *Occasionally a late evening admission may occur. Drs. Melvin Pinn, Jr., Jessica Schorr-Saxe and David Hall.

FMED 462. HUNTERSVILLE/NORTH MECKLENBURG FAMILY PRACTICE GROUP. Dr. Ellithorpe is in family practice with two other board-certified family practitioners. Approximately 40–50 patients are seen each day by Dr. Ellithorpe and one other doctor. The third physician is in another clinic. All ages are seen in this practice, although no OB is done. Patients are admitted to University Memorial Hospital, located 10 miles from the office, near UNC-C. Rounds are made daily at the hospital and in the Oaks, a 300-bed nursing home, located in Huntersville. The call schedule responsibility is left to the student's discretion. (Huntersville is a small community about 20 miles north of Charlotte.) Dr. Charles Ellithorpe.

FMED 470. RED SPRINGS/ROBESON FAMILY PRACTICE. Drs. Locklear and Chavis, both alumni of UNC Medical School established this practice in 1983. The practice is now located in a new facility which has 10 exam rooms. The two doctors see between 75–95 patients a day. The patient population is 25% children, 45% adults and 30% geriatrics. No obstetrics is done. Patients are admitted to Southeastern General Hospital in Lumberton, about 16 miles south of Red Springs. The office hours are 8:00–5:30 Monday–Friday, Saturday 9:00 a.m.–12:00 p.m. and being on call is required. An RN, lab tech, an LPN and 2 PA's (1 full-time and 1 part-time) complete the office staff. Drs. Locklear and Chavis.

FMED 471. ROBBINS. Dr. William Bell established his solo practice in his hometown of Robbins, in August, 1981. He sees between 30–45 patients a day and has an average of 6 patients in Moore Memorial Hospital which is located in Pinehurst, about 20 minutes from Robbins. The practice population is about 25% children, 50% adults, and 25% geriatrics. Dr. Bell does not do obstetrics. The office staff includes an RN, Janet Ritter, and two medical secretaries, Rhonda Sessoms and Vicky Emmons. The clinic hours are Monday–Friday 9–5, except Wednesdays when the clinic is opened from 9–12. Taking call and hospital rounds with Dr. Bell is encouraged, but not required. Dr. William Bell.

FMED 473. BLOWING ROCK/BLOWING ROCK MEDICAL CLINIC. The clinic is located in a wing of the Blowing Rock Hospital, a 28-bed facility, with an adjacent 72-bed long-term care center. The clinic load is typically 60 patients a day. Each student is given a handout of general guidelines at the start of the rotation. Following is a paragraph pertaining to the call schedule: Some of the most interesting situations occur outside of office hours. We obviously do not expect you to be "on call" on a 24-hour-a-day basis, but if you will keep the acute hospital nurse advised of your whereabouts after office hours, you will improve the likelihood of your suturing lacerations, participating in fracture reductions, lumber punctures and the like. One of the clinic doctors is on call each night and on weekends. Check with the doctor on call for his expectations of your availability at night and on weekends. When possible, we will be provide you with a beeper. (Blowing Rock is a mountain resort town approximately 175 miles from Chapel Hill). Drs. Charles Davant, Jr., Charles Davant, III, John Davis, Jr., Glenn R. Liesegang.

FMED 474. MADISON. Dr. Joyce started the practice in 1952 and Dr. Moore joined him in 1980 after completing his residency training at the Roanoke Family Practice Program. Dr. Hughes joined the practice in August 1986. The practice sees over 100 patients a day. In the summer of 1987, Dr. Hughes was one of only 12 first-year family physicians nationwide chosen to receive the Parke-Davis Teaching Award from the AAFP. (He was the only physician from our state to receive this award). Dr. Bill Billica joined the practice in December of 1988. He was a Morehead scholar and a graduate of UNC School of Medicine. The patient population is 25% children, 45% adults and 30% geriatrics. The doctors do not maintain a hospital practice and do not do obstetrics. They do compensation work for local industries. The office has x-ray and lab facilities, spirometry and audiological equipment and a well equipped in-office laboratory. The staff consists of an office manager, insurance coordinator, five receptionists, three RN's, LPN, medical office assistant and a certified lab technician. Office hours are from 8:00–5:30 Monday–Friday and Saturday mornings. The clinic is located north of

Greensboro and is 1½ hours from Chapel Hill. There is no required call schedule after hours, however, students may be called for any interesting cases after hours that are seen by the on-call MD. Drs. Moore, Hughes, Joyce and Billica.

FMED 476. EDEN. Drs. Kevin Howard and Paul Sasser are in a partnership in Eden, NC, a town of 15,000 people north of Greensboro and about 1½ hours from Chapel Hill. The office is located adjacent to Morehead Memorial Hospital. The practice is young—Dr. Howard moved here to establish his solo practice in July, 1985. Dr. Sasser joined him in July, 1987. The practice population is also quite young involving about 40% pediatrics, 40% internal medicine, 10% geriatrics and 10% OB. They deliver 120–150 babies a year. On average each doctors sees between 30–35 patients a day. The student will spend two weeks with each physician and will have an opportunity to see interesting cases. Call expectations include 2 nights/week (weekends are totally optional.) The staff includes Valerie Cruise as an RN and Linda Wyatt as an LPN. The office hours are Monday, Thursday and Friday: 8:30 a.m. to 5:00 p.m. and Tuesday, 8:30 a.m. to 8:00 p.m. Drs. Kevin Howard and Paul Sassar.

FMED 477. GREENSBORO/FAMILY PRACTICE CENTER. The Family Practice Center is located at Moses Cone Hospital acting as the model office for the UNC affiliated Moses Cone Family Practice Residency Program. Students work full time in the Family Practice Center seeing acute ambulatory care problems. Emphasis is placed on initial patient contact by the students. Students are expected and encouraged to participate in the clinical decision making process. Precepting is provided mainly by the full-time residency faculty. Senior residents and private volunteer faculty also precept on occasion. Students do not take call. Patient volume varies with the ability and efficiency of the individual student. Most students average 8–10 patients per day for which they take primary responsibility. Once at the site, a car is not needed for this rotation. (Greensboro is a one hour drive from Chapel Hill.) Drs. Thomas A. Cable, Bill Hensel, Bert Fields and Wayne Hale.

FMED 478. GREENSBORO/GUILFORD COLLEGE FAMILY PRACTICE. This group of family practice physicians see 150–200 patients each day. A broad spectrum of patients is seen in the clinic, but no OB is done. This clinic now has laboratory equipment for basic procedures. Stress EKG's, holter monitors, spirometry, audiograms and routine office cultures are some of the procedures students will be exposed to. The physicians have admitting privileges at three hospital, and students have the option of making daily rounds and participating in night and weekend call. Another area of optional student involvement is the review and evaluation of patients in a nursing home for which these physicians have responsibility. Staff includes RN's, LPN's, a physician extender, a lab technician, an x-ray technician and administrative staff. (Greensboro is a one hour drive from Chapel Hill). Drs. Robert Foreman, Joel H. Heller, Robert K. Thacker, Stephen Miller and Kevin Little.

FMED 481. ASHEVILLE. This Senior Selective in the Asheville area is organized to capitalize on the unique resources available in the western part of the state, namely, a predominance of primary care practices to serve regional health care needs. Students selecting this site will be assigned to private physicians' offices in rural communities around Asheville or in the Family Practice Center for the majority of the rotation. Taking call is optional at each site. To augment the clinic experience, students will meet each Wednesday for a half-day with faculty from the MAHEC Family Practice Residency Program in Asheville for seminars covering a wide range of topics such as common ambulatory problems, health promotion, substance abuse, office management, and family systems. If you have any questions about this site, please contact the Course Director, Lisa Slatt, M.Ed., at 966-2091. Dr. Richard F. Walton, Asheville Family Practice Residency Program and community physicians from the towns of Marion, Waynesville, Weaverville, Hot Springs and Highlands.

FMED 485. BAKERSVILLE/BAKERSVILLE COMMUNITY MEDICAL CLINIC. This group practice includes four family practitioners, a family nurse practitioner, three LPN's, and seven administrative and clerical personnel. The practice has an active OB component. Students are expected to be at the clinic when it is open. (Monday–Friday, 8:30 a.m. to closing time). An orthopedic clinic is held once a month. Students may also participate in family planning, prenatal and pediatric clinics at the county health department. Other options with this practice include home visits, ambulance service, and mental health center visits. Daily patient load is approximately 50 people. Call is optional (depending on student interest). Students will need a car in order to get to and from hospital, practice and housing. (Bakersville is a five hour drive from Chapel Hill.) Drs. Jerry D. Cade, James B. Carroll, Arch Woodard and Barbara Anne King.

FMED 487. FRANKLIN. Dr. Battle and Dr. King have practiced in Franklin for 6 years. These two physicians now maintain separate practices. The student's experience will be with either Dr. Battle or Dr. King, and will include inpatient hospital work as well as a busy outpatient office. The office staff at each practice includes 1 nurse, 1 lab and x-ray technician, an office manager, one medical transcriptionist, 1 receptionist and 1 secretary. Students would be exposed to most all aspects of family medicine including routine office surgery, gynecology, pediatrics, geriatrics, adolescent medicine, internal medicine and emergency medicine. Students will be expected to take call and make rounds at Angel Community Hospital, which is a busy 85-bed local hospital. Students will take call with the on-call physician. Students will be on-call either one or two weekends during his/her rotation in Franklin. Franklin has a busy insulary health service consisting of home health, county health, and mental health centers for the western eight counties of the state. Students will get experience in gynecologic exams at the Macon County Health Department during routine gynecology clinic each Friday morning. A car is needed at this site because of housing arrangements. Franklin is a fairly conservative area in the rural part of North Carolina located in the mountains of Western North Carolina. (Franklin is a six-hour drive from Chapel Hill.) Drs. Ben Battle or Dr. Garland King.

FMED 490. SYLVA/SYLVA MEDICAL CENTER. This practice consists of four family practitioners and three internists whose case load is 90% primary care. Obstetrics is part of the family physicians' practice. Each physician usually sees twenty patients a day. Students are expected to attend hospital rounds and may participate in night and weekend call or every third night if they wish. The student will be able to see and evaluate patients both in the clinic and in the hospital. If a student requests, the practice will rotate him or her through specialties available in the community, including hospital-based pathology, radiology, and anesthesiology. In addition, students may make visits with home health nurses and spend time in other area health facilities. (Sylva is a five to six hour drive from Chapel Hill.) Drs. Robert Adams, William Aldis, Ronald Risher, Frank Betchart, David Ramsey, Randall Provost and Beth Baily.

FMED 493. HENDERSON/HENDERSON FAMILY MEDICINE CLINIC. These six family physicians see about 180 patients each day in their clinic. Seven other doctors are housed in the same building, allowing excellent access to consultants. One doctor is on call for the clinic each day at the hospital and has a light appointment schedule. The students work with the doctor on call. The student has his/her own examining room and will see walk-in patients. For continuity of care the student is encouraged to see these patients when they return to the clinic. Students are expected to make rounds each morning. Students who elect to stay in Henderson, rather than commute to and from Chapel Hill, also have the option of emergency room call. This clinic has no obstetric patients. (Henderson is a one hour drive from Chapel Hill.) Drs. Millard W. Wester, Jr., G. Reginald Tucker, Jr., W. Beverly Tucker, W. Rodwell Drake, Jr., Randolph Mills and J. Franklin Mills, FMED 494. ROXBORO. Dr. Winslow is a solo practitioner. His office staff consist of a physician's assistant, 1 lab tech, a LPN, a receptionist, a typist and an office manager. Dr. Winslow and the PA see between 50–70 patients per day. Patients are admitted to Person County Memorial Hospital which is next door to the office. The practice consists of 30% children, 45% adults and 25% geriatrics. Taking call is an encouraged option. Dr. Winslow.

FMED 497. WOMACK ARMY CLINIC—FR. BRAGG. Students will work in an outpatient family practice clinic setting during this four-week rotation. They will attend the teaching conferences that are given for the Family Practice residents. This is an outpatient clinic which serves the enlisted personnel and their families. This clinic is staffed by 5 board-certified family practitioners who function as teaching preceptors. This is a high-volume practice, about 250 patients per day, and a wide range of problems. An interesting aspect of the care provided is Sports Medicine, since the Army requires its members to participate in a vigorous daily physical fitness regimen. This results in many orthopedic injuries. The patient population is 30% pediatrics, 65% adults and 5% geriatrics. The doctors do about 250 deliveries a year. Call responsibilities include the following: one OB in-house call, and 2 Family Practice calls out-of-house—beeper use. Students may choose to work on the ER shift as well. The student is actively involved in patient care and learning/performing outpatient procedural skills. The rotation is tailored to meet students' specific clinical interests. Ft. Bragg is 1½ hours from Chapel Hill. Drs. Jack Wright and Nick Tuttle.

ACTING INTERNSHIP SELECTIVES

In February, 1976, the Educational Policy Committee voted that "the elective (selective) other than the Family Medicine Selective, currently required of all fourth-year students in which the student has primary and direct responsibility for the continuing care of patients, be taken in one of the UNC School of Medicine programs in AHEC hospitals."

The acting internship selectives for senior students provide "off-campus" experiences which will afford an opportunity for each student to be involved in direct and continuing care of patients in a community. The objectives of this program are:

1. To provide the student with an opportunity for direct and continuing patient care responsibilities beyond the level experienced as a third year student. Every effort will be made to have the student function within the limits of his/her abilities, as an integral part of the health care team.
2. To provide the student an opportunity to become familiar with a community hospital, its role as a health resource to a region, its relationship to the physicians in a community, and the manner in which physicians utilize this resource.
3. To provide the student an opportunity to become familiar with the variety of patient types served by a community hospital.
4. To provide the student an opportunity to improve his/her clinical skills.
5. To provide the student an opportunity for a transitional experience between medical student and house officer responsibilities.

The Medicine and Pediatric teaching services at AHEC hospitals are being modified to give students more clinical responsibility in this selective. Acting interns will be essential members of the ward teams, although a student's patient load can be adjusted according to his/her aptitude. These acting internships must be filled on virtually all rotations to maintain the inpatient teaching services. Since the Ob-Gyn and Surgery services currently do not depend on acting intern coverage, the number of students fulfilling the AHEC selective requirement by Ob-Gyn and Surgery acting internships will be limited, and students with special reasons for choosing these rotations to meet the requirement should so indicate on their AHEC selective request form. Note that all courses listed for the selective are also available as electives, so that any student may take several AHEC acting internships.

For more detailed information about scheduling, housing and registration, please refer to the current handbook "The Elective Program."

Listed below are the current offerings for the Acting Internship:

AHEC 401. ACTING INTERNSHIP/MEDICINE/MOSES CONE MEMORIAL HOSPITAL. Students will service as the primary physicians to patients with both acute and chronic medical problems. On most months two AIs will be assigned together to our "B service" which admits non-private patients from our medicine clinic or emergency department. The students will be on-call together under the supervision of a junior or senior medical resident and will divide the workload of one intern position. All conferences, seminars, and rounds will be open to the students. Meeting time: Monday, 8:30 a.m. Place: Dr. Lane's Office, Room 1012. Two students per period. (1 student in period 2)

AHEC 402. ACTING INTERNSHIP/MEDICINE/CHARLOTTE MEMORIAL HOSPITAL. This rotation emphasizes primary patient care involving a blend of inpatient and outpatient experiences. The student functions as an acting intern on one of four ward services and will experience primary responsibility for the care of assigned patients under the supervision of a junior resident and an attending. Required conferences include daily subspecialty lectures, weekly grand rounds, and a weekly ECG conference. The acting intern will attend the general medicine outpatient clinic two or three times each week. This provides a means of developing skills for the efficient management of acute or chronic illnesses as seen in the office of a general internist. Faculty: Drs. McCall, Frazier, Baucom and Porter. Two students per period. Meeting time: 8:00 a.m. on the first Monday of the rotation. Place: Dept. of Medicine, 5th Floor AHEC for orientation.

AHEC 403. ACTING INTERNSHIP/MEDICINE/WAKE MEDICAL CENTER. Students will function as primary physicians to patients with both acute and chronic medical problems. The course offers an opportunity for students to see how clinical medicine is practiced in a community hospital. The students will work closely both practicing physicians and full-time faculty, as well as house-staff, in care of these patients. At the completion of this acting internship, each student will be expected to demonstrate competence in obtaining pertinent clinical data through the history and physical examination; in clinical reasoning and diagnostic acumen; in ability to formulate and implement cogent and practical diagnostic and therapeutic plans; in ability to establish effective, productive relationships with patients, professional colleagues and other health team members; in assuming professional responsibilities, including self directed learning; and in understanding the physician's role in dealing with the biomedical and psychosocial problems of patients. Faculty: Faculty at Wake and UNC. Two students per period.

AHEC 404. COMBINED ACTING INTERNSHIP/MEDICINE/NEW HANOVER MEMORIAL HOSPITAL. The students will serve as physicians to patients with both acute and chronic medical problems. During the 4 week rotation usually each student will spend 2 weeks on a housestaff critical care team and the other 2 weeks on a housestaff general medicine team. If there is only one AI assigned during the rotation he/she will spend the entire 4 weeks on the general medicine team. These assignments offer an opportunity for students to learn and experience practical clinical medicine. Students work closely with housestaff and attending physicians. All conferences, seminars and rounds will be open to the students. Faculty: Dr. Ungaro, full-time and clinical faculty at New Hanover and UNC. Two students per period.

AHEC 405. ACTING INTERNSHIP/MEDICINE/HERITAGE HOSPITAL. The Tarboro Clinic, P.A. is a 16 physician multi-specialty group practice located adjacent to Heritage Hospital, a 127-bed private hospital. The acting internship is designed to acquaint the student with the scope of services for which a general internist is responsible. The student will work in the Tarboro Clinic, P.A. group practice facility during the day and will take night call as appropriate. S/he will be responsible for the initial history and physical on those patients whom s/he encounters who require admission and will be responsible for their follow-up with the admitting physician during the hospitalization. Daily teaching rounds on the in-patient service will be conducted by members of the Tarboro Clinic, P.A. staff. Opportunities will also be made available to the student to spend brief periods of time in other health facilities in the community such as the health department, satellite clinics, social service office, solo practitioner's office, and local mental health facility. The student will also participate in weekly teaching conferences of the clinic and hospital. Faculty: Dr. John Brooks and Dr. George Hemingway. One student per period. Area L Rotation Coordinator—Wiley T. Ballance, M.A., (919-972-6958)

AHEC 406. ACTING INTERNSHIP/MEDICINE/NASH GENERAL HOSPITAL. Students will serve as acting interns in Nash General Hospital under the supervision of clinical faculty who are in the private practice of Internal Medicine in Rocky Mount. The student will be assigned selected patients who are hospitalized under the care of the responsible clinical faculty member and other hospitalized patients who are of particular teaching value. For these patients, the student will be given appropriate responsibility in terms of assuming responsibility for ordering diagnostic evaluation, writing orders, etc. The opportunity will also be made available for the student to actively participate in the Emergency Services of the hospital. Faculty: Clinical faculty at Nash General. One student per period. Area L Rotation Coordinator—Wiley T. Ballance, M.A., (919-972-6958)

AHEC 412. ACTING INTERNSHIP/OB-GYN/CHARLOTTE MEMORIAL HOSPITAL. The student will participate in both didactic and clinical settings pertinent to obstetrical and gynecological physiology and pathophysiology. History and physical examination will be performed on ambulatory and hospitalized patients. The student will formulate plans for the care of obstetrical patients, monitor the maternal and fetal patient during labor and participate in her delivery. With the gynecological patient, the student will be involved in the pre-operative evaluation, surgery, and post-operative care, encouraging total continuity of care of the patient. Observation of obstetrical and surgical techniques and the discussion of the basis of the selection of procedures will be stressed. Faculty: Dr. Ronald Wade and staff. One student per period except period 2.

AHEC 414. ACTING INTERNSHIP/OB-GYN/NEW HANOVER MEMORIAL HOSPITAL. This program is designed to provide an advanced experience in gynecologic surgery and high risk obstetrics to the student interested in Obstetrics and Gynecology as a career. It will not result in many additional "routine" deliveries as these are legitimate province of the third year student. The acting intern can expect to improve his/her skills as a surgical assistant and to become involved in the management of complicated obstetrics patients. The student will function under the direct supervision of the attending staff but will work with and for the residents as a part of the health care team. Dr. Jack Daly and staff. One student per period except period 2.

AHEC 421. ACTING INTERNSHIP/PEDIATRICS/MOSES CONE MEMORIAL HOSPITAL. Students will have the opportunity to function as first year residents on the Pediatric ward of a moderate size community hospital. Students will have contact primarily with hospitalized patients, but will also get experience working with ER patients. Procedures are supervised and orders countersigned by junior residents. The elective is ideal for students interested in a Pediatrics or Family Medicine residency. Drs. Silber, Sharpless, Ravenel, and attending pediatricians. One student per period.

AHEC 422. ACTING INTERNSHIP/PEDIATRICS/CHARLOTTE MEMORIAL HOSPITAL. A general pediatric acting internship experience is provided in a 841-bed teaching community hospital with 46 pediatric medical, surgical, and intensive care beds. Specific activities include the following: (1) direct patient care on the inpatient service with supervision from pediatric residents and attendings, (2) daily attending rounds,

(3) participation in the pediatric emergency area, (4) daily acute and follow-up ambulatory pediatric clinic with consultation from pediatric residents and attendings, and (5) subspecialty clinics. One student per period. Call every 3–4 day/nights. Preceptors: Drs. Richard D. Kenney and James A. Taylor, Jr. Meeting place: Department of Pediatrics, 4th Floor, AHEC Building, Charlotte Memorial Hospital and Medical Center.

AHEC 423. ACTING INTERNSHIP/PEDIATRICS/ WAKE MEDICAL CENTER. Wake Memorial Hospital is a 516 bed hospital in Raleigh. There are 26 beds for children on a combined Pediatrics-Surgery ward. Pediatrics house staff from UNC Hospitals rotate through this service and the acting intern will be part of this team. The acting intern will be responsible primarily for patients on the ward. This elective is designed to provide exposure to the types of illness seen in a community hospital while providing a close association with faculty preceptors and practicing physicians. Students will be on call every third night. They should report on the first day to the Wake AHEC Pediatrics Department Office. Room Med 01 at 8:00 a.m. Faculty: Drs. Ingram, Vaughan, Thullen, Dunn, Young and private physicians. One student per period.

AHEC 432. ACTING INTERNSHIP/SURGERY/CHARLOTTE MEMORIAL HOSPITAL. Students will work as clinical clerks or externs under direct supervision of housestaff and attending staff, the latter including a full-time Director of Surgical Training. Work will consist of doing histories and physical examinations upon and of observing and assisting with preoperative and postoperative treatment of hospitalized patients, and also of acting as second assistant during operations on these patients. Students also will work in the clinics, and if desired, will be placed on a night call roster to assist house officers with nocturnal surgical activities. The practical experience thus gained will be complemented by regularly scheduled formal conferences and lectures and by informal person-to-person instruction and discussion as the opportunities for the latter present themselves. Faculty: Dr. Walker and staff. One student per period.

AHEC 434. ACTING INTERNSHIP—SURGERY—NEW HANOVER MEMORIAL HOSPITAL. This elective is designed to offer the student an opportunity to obtain instruction in management of general and allied specialty surgical patients from full time practitioners in the community. The student will be assigned to a team of two surgeons and will have the opportunity to examine all patients admitted to the team, to record findings for review by the attendings, and to assist at operations. At appropriate times, the student will participate in the private physicians' office practice located adjacent to the hospital. In addition to daily rounds and operations with the team, the student will attend and participate in all conferences related to surgery which include Surgical Pathology Conference and Surgical Staff meeting. Daily surgery conferences, Monday–Friday. Faculty: Drs. Maxwell, Clancy and Associates. One student per period.

DEPARTMENT OF ANESTHESIOLOGY

ANES 401. ACTING INTERNSHIP/ANESTHESIOLOGY (6). The primary objective of this Acting Internship is to provide insight and training in the principles of anesthesia and intraoperative care. Experience will include: (1) pre- and postoperative evaluation of patients, with direct patient responsibility, (2) care of the anesthetized patient, (3) clinical pharmacology and physiology of the perioperative period, (4) the principles and practice of both regional and inhalational anesthetic techniques including intravenous therapy, the principles of the intravenous administration of drugs, airway management and endotracheal intubation, cardiovascular monitoring, and the care of critically ill patients during the operative period, (5) diagnosis and treatment of chronic pain problems, and (6) further training in the principles of cardiopulmonary support. Faculty: Dr. Robert W. Vaughn and staff.

ANES 403. ANESTHESIOLOGY RESEARCH (6). The goals of this program are to introduce the medical student to clinical and basic research in anesthesiology. The programs offered include: (1) clinical research in Obstetrical Anesthesia (Fred Spielman, M.D.), (2) brain monitoring in anesthesia (Drs. Enid R. Kafer and Michael R. Isley), (3) oxygen transport and monitoring techniques in cardiac anesthesia (Drs. Edward Norfleet and Warner Lucas), (4) high frequency ventilation (Dr. Warner Lucas), and (5) neuropharmacology (Dr. Robert A. Mueller). Faculty: Drs. Fred Spielman, Enir R. Kafer Edward Norfleet and Robert A. Mueller.

ANES 404. BRAIN MONITORING RESEARCH PROGRAM (6). The goals of this program are to offer an introduction to sophisticated computer analysis of the electroencephalogram (EEG) and evoked potentials (EPs) (auditory, visual and somatosensory) during anesthesia, and the role of EEG/EP analysis in the early detection of potential neurologic complications during cardiac and major vascular anesthesia. Our current instrumentation includes systems with multichannel regional representation and brain mapping. Faculty: Drs. Enid R. Kafer, Michael R. Isley, Paul Shinkman and Edward Norfleet.

DEPARTMENT OF BIOCHEMISTRY AND NUTRITION

BIOC 134. CASE STUDIES IN STRUCTURAL MOLECULAR BIOLOGY (3). Principles of macromolecular structure and function with emphasis on proteins, molecular assemblies, and ATP enzymology. Faculty: Dr. Charles W. Carter.

BIOC 140. INTRODUCTION TO CHEMICAL PATHOLOGY (3). Selected topics in chemical pathology; i.e. endocrinology, toxicology, immunochemistry, enzymology. Faculty: Drs. Silverman, Hammond, Cross, Chapman and Forman.

BIOC 144. PHYSICAL BIOCHEMISTRY (3). Theory and methods applicable to the study of biological macromolecules. Topics will include: macromolecules in solution, applications of random-walk theory, multiple equilibria, magnetic resonance spectroscopy, and theory and applications of fluorescence spectroscopy. Faculty: Drs. Jan Hermans and Barry Lentz.

BIOC 227. NEUROCHEMISTRY (3). An introductory course in biochemistry of the nervous system. Topics include aspects of energy metabolism, ion movements, neurotransmitters, intermediary metabolism and molecular biology in the nervous system. Faculty: Drs. John E. Wilson and Pierre Morell.

BIOC 301. RESEARCH IN BIOCHEMISTRY (var.). Research in Biochemistry. Faculty: staff.

BIOC 302. RESEARCH IN BIOCHEMISTRY (var.). Research in Biochemistry. Faculty: staff.

DEPARTMENT OF CELL BIOLOGY AND ANATOMY

Please refer to the departmental graduate course listing for further information on course offerings.

DEPARTMENT OF DERMATOLOGY

DERM 401. DERMATOLOGY (6). Activities include outpatient clinics 5 days a week, ward rounds once or twice a week, 5 conferences or seminars per week, and time for reading. During this elective the student should become proficient in diagnosis and management of most of the common diseases of the skin and he/she should acquire considerable knowledge of the pathology and physiology of skin. A portion of the time may be spent in the private office of a practicing dermatologist and in outlying AHEC clinics. Students will be expected to fly to some outlying clinics. Faculty: Drs. Briggaman, Gammon, O'Keefe, Tomsick, Wheeler and Woodley.

DERM 402. RESEARCH IN DERMATOLOGY (12). This elective is designed for the student at any level who desires to spend a minimum of two months full-time in one of the Dermatology Research Laboratories. Depending upon the desires of the student and the preceptor, an opportunity would be available to become acquainted with the basic methods in immunology, tissue culture, immunofluorescence, or electron-microscopy. Interested students should contact one of the faculty at least two months prior to the anticipated starting date. Faculty: Drs. Briggaman, Gammon, O'Keefe and Woodley.

DERM 405. DERMATOLOGY, MOSES H. CONE MEMORIAL HOSPITAL (6). This rotation is a preceptorship with a group of dermatologists having a large office practice. Most of the student's time is spent examining and assessing patients with a wide variety of skin problems under the direct supervision of practicing dermatologists. Regular review of dermatopathology specimens with the dermatopathology resident and senior pathologists, and attendance at dermal consultations and medical conferences in the hospital are available to the student. Faculty: Clinical faculty in Dermatology.

DEPARTMENT OF FAMILY MEDICINE

FMME 401. FAMILY MEDICINE AND COMMUNITY FIELDWORK (6). This elective provides students with an opportunity to spend time with a family physician practicing in an ambulatory setting and observe the delivery of health care in that community. For pre-clinical students, credit for this course will be based solely upon the completion of a community questionnaire which is due one week after completion of the elective. The questionnaire looks at factors in the community such as industry, resources in the community, and age of general population, and is designed to be completed in increments throughout the elective. For clinical students, credit will be based on the preceptor's assessment of clinical performance. All students are responsible for initially selecting a preceptor. Approval will be made by the course director. No credit will be given if payment for student participation in this program exceeds medical school guidelines. Interested students should contact Lisa Slatt, M.Ed. in the Student Office of the Department of Family Medicine (966-2091) to arrange for interviews and credit. Faculty: Lisa Slatt, M.Ed. (Course Director).

FMME 406. DIRECTED STUDIES IN FAMILY MEDICINE I (3). This course is designed to familiarize preclinical students with issues and perspectives in family medicine. Students will observe and participate in investigative studies in family medicine and primary care. Exposure to research methodology and research projects in process is an integral facet of the course. Topics range from medical systems and continuity of care to family health behavior and doctor-patient interaction. Interested students should contact the office of Dr. Peter Curtis or the Student Coordinator, Ms. Carolyn Joines in the Department of Family Medicine (966-2091) to arrange an appointment. Faculty: Dr. Peter Curtis and other Family Medicine faculty.

FMME 407. DIRECTED STUDIES IN FAMILY MEDICINE II (6). The course is designed to allow a student in the clinical years to carry out a project in family medicine. Students will design and conduct a research project under the direction of a practicing physician. The course will emphasize the clinical relevance of social and epidemiological research methods. Resources for this experience include the Family Practice Data Bank, which contains information from 24,000 daytime patient visits and 4,000 after-hours calls. Alternatively, students may concentrate on refining clinical diagnosis and management. Both hospitalized and ambulatory patient care would be included. Interested students should contact the office of Dr. Peter Curtis or the Student Coordinator, Ms. Carolyn Joines in the Department of Family Medicine (966-2091) to arrange an appointment. Faculty: Dr. Peter Curtis and other Family Medicine faculty.

FMME 408. HEALTH CARE FOR FEMALE PATIENTS (1). This elective will focus on issues relevant to the primary medical care of female patients. Topics include: women's perspectives on health care; implications of the Women's Health Movement for primary medical care; women's traditional role as caretaker of family health, and the influence of changing roles of women on family health; comparison of utilization of primary medical services by women and men; social issues in the clinical management of prevalent non-life threatening health problems for women. This elective will be taken either as a tutorial or as a seminar. Students in the tutorial will be required to prepare either a paper or a research proposal on a topic selected in consultation with the instructor. Each student in the seminar will be expected to make one class presentation on a selected topic about primary care for women. Interested students should contact Betty Cogswell at 966-3711 to arrange appointments. Faculty: Dr. Betty Cogswell.

FMME 409. CLERKSHIP IN FAMILY MEDICINE (6). This elective focuses on the core content of the family, the community and common ambulatory medical problems in the office setting. Students may choose among four coordinating sites: Greensboro, Charlotte, Chapel Hill or Asheville. The clerkship follows a similar format regardless of the coordinating site. One day a week is devoted to seminars on the core content and other topic areas. The last day of the rotation is a wrap-up session. The majority of a student's time is spent seeing patients under the supervision of board certified family physicians practicing within commuting distance of the coordinating site. This course will satisfy the requirements for the required fourth-year senior selective in Family Medicine. Please contact Ms. Carolyn Joines in the Family Medicine Student Office, (Trailer 26, 966-2091) for specific description of each coordinating site and to register for the course. Faculty: Dr. Gregory Strayhorn (Course Director) and Family Medicine faculty.

FMME 413. (MEDI 419) INSTRUCTION AND EVALUATION IN MEDICAL EDUCATION (var.). This elective is designed for the student who is interested in education or is considering a career which will involve some commitment to teaching. The elective centers on participation in instructional development, teaching, and/or evaluation projects. The student may want to conduct his/her own project in consultation with an advisor from a basic science or clinical department and a faculty member from the Office of Educational Development. The project might focus on: (1) educational research addressing a topic of particular interest to the student, (2) determination of the instructional goals or objectives for a particular course or program, (3) design of a new curriculum or course or appropriate teaching strategy for a short course, (4) participation in a student evaluation process such as the OSCE, (5) development of computer-based, video, "hands-on" or printed educational materials, and (6) evaluation of an existing course or educational program. Faculty: Drs. C. Friedman, W. McGaghie, H. Frierson, W. Mattern, and F. Stritter.

FMME 416. ASHEVILLE ADVENTURE IN FAMILY MEDICINE/MAHEC/ASHEVILLE FAMILY PRACTICE RESIDENCY (6). This elective, designed primarily for the fourth year student, is set in a rural, mountain community in the offices of board certified family physicians. The student actively participates in a private, family-oriented practice which incorporates first hand experience with one-on-one teaching. Weekly didactic and discussion sessions exploring the principles of Family Medicine are conducted by MAHEC Family Practice Residency Program faculty.. For permission and information regarding scheduling, travel and housing, contact Ms. Carolyn Joines at the Department of Family Medicine in Chapel Hill (919-966-2091) or Ms. Jan Sturgis at MAHEC in Asheville (704-258-0670). Faculty: Drs. Hicks, Hulkower, Jensen, Martin, Pyeritz, Olson, Walton and residents.

FMME 417. ACTING INTERNSHIP/FAMILY MEDICINE/UNC HOSPITALS (6). This elective is designed to give a broad experience in family medicine for students who are interested in a career in that specialty. The student will be assigned to the Family Medicine inpatient service and will be supervised and evaluated by the inpatient attending and senior resident. The schedule will consist of attendance at Morning Report, Inpatient Rounds, Behavioral Medicine Rounds, Britthaven Nursing Home Rounds, Monday Noon Conference and Wednesday Morning Seminar. One to three half-days per week will be spent in the Family Practice Center, one half-day for a special project in some area of family medicine (e.g., practice management, community medicine, sports medicine, geriatrics—to be negotiated with the attending prior to the elective). Call responsibilities will be negotiable. Faculty: Dr. Gregory Strayhorn and Family Medicine attendings.

FMME 420. ACTING INTERNSHIP/INPATIENT FAMILY MEDICINE/GREENSBORO /MOSES CONE MEMORIAL HOSPITAL (6). The student will serve as an acting intern and a member of the patient care team. Students will round on all inpatients, take primary responsibility of assigned patients, actively participate in teaching rounds, attend scheduled conferences and take night call. Inpatients for this service are generated from the residencies' Family Practice Center. Because of the ambulatory primary care patient base, students receive excellent exposure to the common medical problems requiring hospitalization in Family Medicine. For permission and further information, please contact Ms. Lisa Slatt at 966-2091 (Department of Family Medicine Student Office). Faculty: Drs. Cable, Hensel, Fields, Hale and residents.

FMME 421. ACTING INTERNSHIP/INPATIENT FAMILY MEDICINE/ASHEVILLE MISSION MEMORIAL HOSPITAL (6). The student will serve as an acting intern and a member of the patient care team on the Family Medicine Teaching Unit at Memorial Mission, with opportunity for ambulatory follow-up. Daily activities will include rounds, conferences, patient work-ups, supervised procedures and other inpatient management. The student will be included in the night call schedule with the resident on service, will see patients in area nursing homes and other community resources, and will be scheduled for patient care and precepting at the Mountain Area Family Health Center. For permission and further information regarding scheduling, travel and housing, please contact Ms. Carolyn Joines at the Department of Family Medicine in Chapel Hill (919-966-2091) or Ms. Jan Sturgis at MAHEC in Asheville (704-258-0670). Faculty: Drs. Hicks, Hulkower, Jensen, Martin, Pyeritz, Olson, Walton and residents.

FMME 422. ACTING INTERNSHIP/FAMILY MEDICINE/CHARLOTTE MEMORIAL HOSPITAL (6). The student will spend the majority of time at the Family Practice Center, with some participation on the inpatient service. While in the Center, students will be involved in direct patient care, chart reviews, audiovisual reviews and active precepting. As a member of the inpatient team, the student will participate on rounds and will take call with a resident approximately five times. Other activities include participating in a seminar series covering the principles of family medicine, case presentations and common problems of family medicine; visiting a 200-bed rest home; a community alcohol rehabilitation center; community agencies of interest; and attending a weekly dermatology clinic. Faculty: Drs. Sigmon, Hall, Menscer, Little, Robinson, Anastasio, Alexander, Lee and residents.

FMME 424. ECONOMICS AND MANAGEMENT OF HEALTH CARE SEMINAR (var). The seminar will focus upon economics and management concepts that are most relevant to medical practice and the health care profession. Students will attend discussions twice a week and complete an independent study project. They will also have opportunities to visit medical practices and health care organizations. Several sessions will be devoted to basic management skills for physician leaders. Faculty: Dr. John J. Aluise.

FMME 425. INTERNATIONAL FIELDWORK IN FAMILY MEDICINE (var). The two goals of this elective are: (1) to allow students to observe and participate in the delivery of primary health care in foreign countries, and (2) to share this experience with fellow students and faculty. The student is required to submit a written report of his/her experience using a format that has been agreed to by the coordinator, the clinical faculty member and the student. This paper will serve as the grade for this rotation. Students are expected to take an active role in designing their elective by submitting a list of personal goals and strategies. Also they are encouraged to take the lead in identifying an international sponsor. However, the coordinator and clinical faculty sponsor will assist students in locating international sponsors, if needed. Funding is not available through the department, however every effort will be made to help the student obtain monies for international travel. Interested students should contact Lisa Slatt at 966-2091. Faculty: L. M. Slatt, M.Ed. and Clinical Faculty Sponsors.

FMME 442. (MEDI 442) CARE OF THE ELDERLY PATIENT (CLINICAL GERIATRICS) (6). In this clerkship, the student will be expected to develop skills in (a) communicating with elderly patients and their families; (b) evaluating their physical, emotional, social and economic abilities to cope with the normal activities and stresses of daily living; (c) assessing the causes of common problems (including delirium, dementia, falls, depression, incontinence); and (d) working with patients, families, health professionals from many disciplines and community agencies to develop rehabilitation goals and implement appropriate care plans. Selected geriatric patients will be evaluated and followed in the clinics and wards of UNC Hospitals and in local long term care settings. Faculty: Drs. Bryan, Hoole, Jones, Pickard, Rizzolo, Sloane, Williams and staff.

DEPARTMENT OF MEDICAL ALLIED HEALTH PROFESSIONS

Please refer to the Undergraduate and Graduate School Records for further information on course offerings.

DEPARTMENT OF MEDICINE

MEDI 403. MEDICAL ONCOLOGY (6). This elective, given along with Hematology (MEDI 408), provides an exposure to the management of patients with solid tumors and hematologic malignancies. Approximately 1–2 new patients are seen each weekday. Daily work rounds with Hematology and Coagulation are held to discuss patient care. Aspects of tumor biology, staging, and treatment are covered in separate didactic sessions. Students will also present an in-depth review of a subject area at the weekly Hematology Medical Oncology/Coagulation Rounds. Weekly conferences with senior staff from radiation oncology, radiology, surgical pathology, and cytopathology allows a demonstration of the multidisciplinary approach to neoplastic disease. Faculty: Hematology/Oncology staff.

MEDI 404. GENERAL INTERNAL MEDICINE CONSULT (6). This elective provides experience for the student in the consultative role of the general internist and geriatrician as it relates to general surgery, obstetrics, orthopedics, other disciplines, and to the care of special problems of the elderly. An average of two in-patient consults are evaluated per day under the supervision of a senior medical resident and/or geriatric fellow. Typical consultations include pre-operative problems, e.g., the case of an insulin dependent diabetic with a history of hypertension and remote myocardial infarction admitted for elective cholecystectomy; and post-operative complications, e.g., pulmonary embolization following total hip replacement. Daily attending rounds discussions will focus on the two major steps of the consultative process: the efficient definition of the pertinent medical problems involved and the derivation of appropriate management recommendations. In the case of geriatric medicine consultations, special aspects of the care of the elderly will be reviewed. Faculty: Drs. Bryan, Carey, Danis, Evans, Hoole, Greganti, Kizer, Lyle, McNutt, Morris, Pickard.

MEDI 405. CLINICAL CARDIOLOGY (6). Emphasis is placed on: (1) physical diagnosis of the heart, (2) electrocardiology, (3) management of cardiac problems seen in consultation on in-patients, (4) hypertension problems in diagnosis and management, (5) diagnostic and management problems in new and old cardiac patients in out-patient department, and (6) use and interpretation of graphic methods. Includes MEDI420 Seminar. Faculty: Division of Cardiology members.

MEDI 406. CLINICAL CARDIOVASCULAR PHYSIOLOGY (6). This elective is concerned with applied physiology of the cardiovascular system. Special emphasis is placed on correlation of physical signs with hemodynamic and angiographic findings at cardiac catheterization. The student can participate as a contributing member of the cardiac catheterization team. He/she can have the opportunity to work-up, examine and present patients pre-catheterization, to interpret and relate the data obtained at catheterization to the patient's symptoms and signs, to enter into the decision making process regarding therapy and to follow many of the patients through cardiac surgery. Considerable free time is provided for in-depth reading in topics of the student's choosing. Includes MEDI 420 Seminar. Faculty: Drs. Dehmer, Jain, Nichols, Tate.

MEDI 407. DIGESTIVE DISEASES AND NUTRITION (GASTROENTEROLOGY) (6). The clinical aspects of gastroenterology, hepatology and nutrition are emphasized in this elective. Special attention is paid to biochemical and physiologic bases for diagnosis and treatment. Students observe and, where appropriate, perform specialized procedures such as endoscopy, secretory studies (gastric and pancreatic), biopsy and radiography. Experience is gained in the interpretation of x-rays and histologic slides of both the bowel and liver. The student may use a learning center which includes a teaching microscope plus equipment for viewing collections of histopathology, tape-slide programs and microfilms. The student participates daily in consultation rounds and works one-half day a month in the GI Outpatient Department. Further instruction includes GI Grand Rounds and a GI Medical-Surgical Conference held weekly, plus a journal club and seminars. Faculty: Drs. Sessions, Bozymski, Heizer, Powell, Orlando, Nuzum, Lesesne and staff.

MEDI 408. HEMATOLOGY (6). This elective is designed to provide fourth year medical students with a broad experience in the principles and practice of clinical hematology. A single attending physician and one or two medical residents are assigned to the rotation at all times. This elective is conducted in parallel with similar electives in clinical coagulation (PATH 408) and medical oncology (MEDI 403), with many shared activities taking place throughout the course of the month. Each student will be expected to participate in morning report & seminars, inpatient & outpatient consultations, weekly conferences, oncology/pathology/ radiology conferences, bone marrow conferences, weekly hematology/oncology/coagulation ground rounds, Saturday morning clinical conferences and hematopathology. Students will participate in daily teaching lectures and be taught how to perform and interpret bone marrows and peripheral blood smears. A schedule of weekly activities will be given to each student at the beginning of the rotation. Faculty: senior staff.

MEDI 409. (SURY402) EMERGENCY MEDICINE/SURGERY (6). This elective offers broad exposure to a variety of medical and surgical problems that commonly present to the UNC Hospitals Emergency Room. The student will evaluate patients, perform appropriate diagnostic studies and assist with common outpatient and emergency procedures in close conjunction with the housestaff and attending. Problems commonly seen include such entities as acute abdominal pain, fractures, soft tissue injuries, head trauma, myocardial infarction, asthma, diabetic emergencies, multiple trauma, etc. There is a twice weekly lecture series on relevant subjects that includes suture technique instruction, and a weekly E.R. conference. The student is expected to work in the E.R. about 35–40 hours a week, rotating with other students in the E.R. Students may attend an EKG Course which meets 3 times a week. Faculty: Emergency Medicine attendings, Surgery and Medicine attendings.

MEDI 410. AMBULATORY MEDICINE (6). The senior medical student will be afforded an opportunity to work closely with the medical faculty in the provision of care to a wide range of adult medical patients seen in several different patient care environments including: the OPD of UNC Hospitals, the Prospect Hill Clinic of OCCHS (a rural satellite clinic 25 miles from Chapel Hill), the Carol Woods Retirement Center, Hillhaven Convalescent Center of Chapel Hill, and patients' homes. Opportunities for complete evaluation of referred ambulatory patients, management of acutely ill patients, and participation in on going management of patients with chronic illness will be made available. Hospital rounds will be made on all patients admitted to the hospital from these settings. Students will attend the daily Medicine Walk-in Clinic Conference series, that addresses the common problems of ambulatory medicine; the Friday Noon Clinic Conference; and a weekly conference on problems in geriatrics. The care of geriatric patients in the context of general internal medicine practice will be emphasized. Faculty: Drs. Bryan, Hoole, Pickard, et al.

MEDI 411. DIAGNOSIS AND MANAGEMENT OF INFECTIOUS DISEASES (6). The primary objective of the program is to allow students to learn diagnostic approaches relevant to infectious diseases, as well as the clinical and laboratory basis of antibiotic therapy. Opportunities to learn the principles of clinical microbiology as applied in the physician's office are available. The functions of an infectious disease consultant and hospital epidemiologist will be demonstrated. Students will work as active members of the infectious disease group providing consultative services at UNC Hospitals. The elective provides the opportunity to study in depth selected patients with infectious diseases, in order to develop the skills required for effective diagnosis and treatment. Faculty: Drs. Lemon, Cohen, Fischer, Kenney, Sparling, van der Horst, Weber and Fellows.

MEDI 412. (PEDS 412) ENDOCRINOLOGY (6). Extensive clinical experience is obtained with patients with endocrine disorders in the Medical Endocrine and Diabetes Clinics, and in the Pediatric Endocrine Clinic. New patients are seen in the clinics and discussed with members of the Medical or Pediatric staff. In-patients are seen on consulting rounds in the main hospital and in the Clinical Research Unit. Problem-solving exercises are conducted on Tuesday and Friday afternoons with one of the faculty. Faculty: Drs. Clemmons, D'Ercole, Earp, French, Gray, Gwynne, Ontjes, Underwood, Van Wyk.

MEDI 413. (PEDS 413) NEPHROLOGY. This elective will provide an in-patient and out-patient experience in the broad area of Nephrology, including a program of supervised reading and tutorial sessions designed to meet the interests and needs of the student. He/she may have the opportunity to learn about the special techniques of Nephrology including: renal biopsy (along with an understanding of the indications and interpretation), the use of the artificial kidney, peritoneal dialysis, and common lab procedures. He/she will work in the Outpatient Department once a week where he/she will work up approximately three in-patients a week. The supervisor will be the consultant assigned to Nephrology at that time. He/she will be encouraged to find out from each member of the Division something of the nature of their research activities. Faculty: Drs. Blythe, Colindres, Gitelman, A. Finn, W. Finn, Lassiter, Mattern, Falk and Morris.

MEDI 414. PULMONARY MEDICINE (6). The student will work with the Pulmonary Medicine consult service responsible for evaluation of patients requiring invasive outpatient and in-patients diagnostic procedures. The staff includes a pulmonary attending, a fellow and a medicine resident. The following activities will be emphasized: a) decision making in patients with pulmonary disease; b) disease mechanisms, risk factors and pulmonary disease prevention; c) use of diagnostic tools including lung function measurements, radiologic procedures, bronchoscopic procedures and biopsy; d) approach to management of common problems such as pleural effusion, hemoptysis, dyspnea, lung nodule/masses, lung infiltrates/infections, chronic hypoxemia. The student will participate in scheduled divisional conferences, present patients to these conferences as appropriate, and interpret pulmonary function test results under the supervision of the attending. Faculty: Full-time attending faculty, Pulmonary Division.

MEDI 415. CLINICAL RHEUMATOLOGY AND IMMUNOLOGY (6). This elective will provide the student with the clinical skills and knowledge required for differential diagnosis, evaluation, and management of patients with connective tissue diseases. Emphasis is placed on the radiographic and clinical diagnosis of common types of arthritis, use of immunologic tests, and the rationale underlying choice of therapy modalities. Participation includes 3 days of Arthritis Clinic, an optional additional day of Clinic at one of our AHEC hospitals, and work-up of patient consultations at UNC Hospitals. The student is an active member of the rheumatology group which interacts as a team with Orthopedics, Nursing and Allied Health personnel. The opportunity for experience in Clinical Allergy (½ day) is available on an optional basis. Faculty: Drs. Winfield, Yount, Hadler, Eisenberg, Cohen, Sauter, and Berger.

MEDI 416. CLINICAL NUTRITION (6). This elective will teach the practical aspects of nutrition support for hospitalized patients consisting of rounds (2 hours daily, 5 days a week) (optional 6 or 7 days per week) with the nutrition support service of a physician, pharmacist, dietitian, and nurse. Patients being followed by the service vary from 5 to 15, and the student can expect to work up and write a consult note for at least 1 patient per week. The student is expected to read background material which has been selected for the course, as well as reading and reporting on a few specific articles relating to patients being seen. Material covered includes the practical aspects of nutrition assessment, nutrition support (oral, enteral, and parenteral), and prevention and treatment of vitamin, trace element and essential fatty acid deficiencies. Surgical and medical patients include some patients with cancer. Faculty: Drs. Hak, Heizer, Holcombe, Lesesne, Nuzum, Raasch.

MEDI 419. (FMME 413) INSTRUCTION AND EVALUATION IN MEDICAL EDUCATION (Var.). This elective is designed for the student who is interested in education or is considering a career which will involve some commitment to teaching. The elective centers on participation in instructional development, teaching, and/or evaluation projects. The student may want to conduct his/her own project in consultation with an advisor from a basic science or clinical department and a faculty member from the Office of Educational Development. The project might focus on: (1) educational research addressing a topic of particular interest to the student, (2) determination of the instructional goals or objectives for a particular course or program, (3) design of a new curriculum or course or appropriate teaching strategy for a short course, (4) participation in a student evaluation process such as the OSCE, (5) development of computer-based, video, "hands-on" or printed educational materials, and (6) evaluation of an existing course or educational program. Faculty: Drs. C. Friedman, W. McGaghie, H. Frierson, W. Mattern, F. Stritter.

MEDI 420. SEMINAR: ECG INTERPRETATION (0). The course is designed to instruct the medical student in the approach to interpretation of the electrocardiogram. Selected tracings, arranged in groups showing specific types of ECG abnormalities will be discussed in meetings to be arranged several times weekly — the students will be expected to study the tracings prior to the meeting using standard text aids. The elective will be offered monthly. Permission to attend must be granted by directors of other electives being taken concurrently. Sign up through Lynn Evans, ECG Lab (966-5121). Faculty: Drs. Gettes, Evans, other Division members.

MEDI 422. MEDICAL ASPECTS OF NUCLEAR WEAPONS/NUCLEAR WAR I (6). The purpose of this elective is to facilitate study of the medical consequences of nuclear weapons and war. The student will explore the health effects of nuclear war and the arms race, and focus on the physicians' response. There will be a written or oral report at the end of the course describing the work done. Faculty: Drs. Young, Coulter, Sheps, Hoole, Lipton, and Simpson.

MEDI 432. ACTING INTERNSHIP/CHARLOTTE MEMORIAL HOSPITAL (6). This rotation emphasizes primary patient care involving a blend of inpatient and outpatient experiences. The student functions as an acting intern on one of four ward services and will experience primary responsibility for the care of assigned patients under the supervision of a junior resident and an attending. Required conferences include daily subspecialty lectures, weekly grand rounds, and a weekly ECG conference. The acting intern will attend the general medical outpatient clinic two or three times each week. This provides a means of developing skills for the efficient management of acute or chronic illnesses as seen in the office of a general internist. Faculty: Drs. McCall, Frazier, Baucom and Porter.

MEDI 436. ACTING INTERNSHIP/CLINICAL RESEARCH CENTER (6). This acting internship is on the Clinical Research Unit of the University of North Carolina Hospitals. Students on this service have an unusual opportunity to carefully and thoroughly study patients with selected diseases, and in participating in various research projects under the guidance of the principal investigators. Students may participate in established clinical research projects or develop and conduct a project of their own under the supervision of appropriate faculty. Daily rounds and conferences are conducted by the Director of the Clinical Research Unit. Faculty: Department of Medicine.

MEDI 437. ACTING INTERNSHIP/COMMUNITY INTERNAL MEDICINE/TARBORO CLINIC, P.A. AND HERITAGE HOSPITAL (6). The Tarboro Clinic, P.A. is a 16 physician multi-specialty group practice located adjacent to the Heritage Hospital, a 127 bed private hospital. The student will work in the Tarboro Clinic, P.A. group practice during the day and will take night call as appropriate. The student will be responsible for the initial history and physical on those patients encountered who require admission, and will be responsible for their follow-up with the admitting physician during the hospitalization. Daily teaching rounds on the in-patient service will be conducted by members of the Clinic staff. Opportunities will be made available to the student to spend brief periods of time in other health facilities in the community such as health department, satellite clinics, social service office, solo practitioners offices, and local mental health facility. The student will also participate in weekly teaching conferences of the clinic and hospital. Area L Coordinator: Wiley T. Ballance, M.A. (919-972-6958). Faculty: Dr. John Brooks and Dr. George Hemingway.

MEDI 438. ACTING INTERNSHIP/NASH GENERAL HOSPITAL (6). Students will service as acting interns at Nash General Hospital under the supervision of clinical faculty who are in private practice in Rocky Mount. The student will be assigned selected patients who are hospitalized under the care of the responsible clinical faculty member, and other hospitalized patients who are of particular teaching value. For these patients, the student will be given appropriate responsibility for ordering diagnostic evaluation, writing orders, etc. The opportunity will also be made available for the student to spend time in the physician's private office and to participate in the Emergency Services of the hospital. Area L Coordinator: Mr. Wiley Ballance (919-972-6958). Faculty: Dr. John Chambliss, et al., Nash General Hospital.

MEDI 439. EMERGENCY MEDICINE/CHARLOTTE (6). This rotation will introduce the student to the clinical practice of Emergency Medicine. By the end of the rotation the student will: (1) have been exposed to a wide spectrum of emergency and non-emergency problems, (2) recognize that the patient defines the emergency, (3) understand how the emergency department relates to other services, (4) develop and improve skills in suturing, interpretation of radiographs and electrocardiograms, establishing IVs, cardiopulmonary resuscitation, lumbar puncture, etc., (5) develop the ability to quickly determine the relevant history and physical with selective use of ancillary services to achieve the most efficient and effective emergency assessment and management. Students are expected to attend all conferences sponsored by the Department of Emergency Medicine. Faculty: Drs. John W. Baker, Marsha Ford, Robert Schafermeyer, Jeffrey Runge, Eve Norton, Chris Martinez, Robert Schneider, Russ Kerns and Steve Monson.

MEDI 440. INTERNAL MEDICINE/RUTHERFORD HOSPITAL/RUTHERFORDTON, NC (6). This clerkship at a 170 bed general hospital and adjacent clinic is supervised by Dr. Jaski. Each student would be assigned one or two internists as his or her main preceptors, but much of the staff will share instructive cases and procedures. Supervised office practice experience is available for students wishing to emphasize outpatient medicine. Supplementary pediatrics, dermatology, gynecology, radiology, orthopedics, urology, and general surgery may be tailored to the student's interests, but primary educational responsibility resides in the Department of Medicine. For further information, contact Dr. Tom Nuzum, 966-2461 or Dr. Thomas Jaski at 704-286-9036. Faculty: Drs. Casp, Jaski, Harding, Hyde, Shapiro and Whitworth in Medicine, and approximately 10 physicians in other fields.

MEDI 441. RESEARCH IN HEMATOLOGY/ONCOLOGY–"BIOPHYSICS OF LEUKEMIC CELL SURFACES" (var.). This course is designed to give students with previous research experience detailed exposure to advanced methods in application of biophysical methods, light scattering, rheology, NMR, etc. to the investigation of abnormalities of cell surface. The course will include clinical exposure to patients with leukemia and clinical evaluation treatment/research (clinical) protocols. The student will learn how to process isolate/purity various cell lines and cell derivation. In addition these reagents will be studied using a variety of advanced biophysical methodology. Faculty: Dr. Don Gabriel.

MEDI 442. (FMME 442) CARE OF THE ELDERLY PATIENT (CLINICAL GERIATRICS) (6). In this clerkship, the student will be expected to develop skills in: (a) communicating with elderly patients and their families; (b) evaluating their physical, emotional, social and economic abilities to cope with the normal activities and stresses of daily living; (c) assessing the causes of common problems (including delirium, dementia, falls, depression, incontinence); and (d) working with patients, families, health professionals from many disciplines and community agencies to develop rehabilitation goals and implement appropriate care plans. Selected geriatric patients will be evaluated and followed in the clinics and wards of UNC Hospitals and in local long term care settings. Faculty: Drs. Bryan, Hoole, Jones, Pickard, Rizzolo, Sloane, Williams and staff.

MEDI 443. (PEDS 443) MEDICAL GENETICS (6). The objectives of this course are learning the clinical approaches and legal pitfalls to anticipating, diagnosing and counseling genetic disorders and malformation syndromes in medical practice. The student will participate in genetic consultations on the wards and in the clinics, and in the evaluation and counseling of patients (approximately 500 yearly) seen in the genetic counseling clinics. Supervised participation is also possible in the counseling and diagnosis of patients having antenatal diagnosis (approximately 600 yearly). The student may choose to make field trips to study a family and a genetic disorder, to read selected topics in medical genetics under supervision, or by special permission, to undertake a research project. Faculty: Drs. Aylsworth, Kirkman, Swift and staff.

MEDI 444. CLINICAL EXPERIENCE IN COMMUNITY MEDICAL PRACTICE (6). Many North Carolina settings for general internal medicine or subspecialty practice are eligible for elective credit through Medicine 444. Participating students will share with their preceptors the daily tasks of caring for patients seen in both office and hospital practice. Emphasis will be placed on increasing the student's skill in diagnosing and treating those conditions most commonly encountered in these settings. In addition, guidance will be offered in analyzing the determinants of effective medical care, and in linking the problems of individuals to those of the community in which they live. Faculty: Physicians in North Carolina.

MEDI 446. CLINICAL GASTROENTEROLOGY/NEW HANOVER MEMORIAL HOSPITAL (6). Opportunity is afforded for students to learn continuous care and management of patients with common gastroenterological disorders. Hospital, clinical and private office patients will be assigned, and the student will assume responsibility in the patient's initial and subsequent therapy. Emphasis will be placed on gastroenterological procedures and endoscopy. Daily teaching rounds will be conducted. Specific afternoon time will be spent in private offices. Regular conferences and assigned reading will provide the student with in-depth perspective of current views on management and disease mechanisms. Faculty: Drs. Wilkins, Rust, Shuford and Meyer and Kittinger.

MEDI 447. CLINICAL CARDIOLOGY/NEW HANOVER MEMORIAL HOSPITAL (6). Students will work with a medicine resident, under the supervision of a full-time faculty cardiologist. They will participate actively in the evaluation and management of in-patients seen in consultation. Emphasis is placed on in-depth study and discussion of clinical problems. Opportunity is provided to improve skill in electrocardiography and to gain experience in non-invasive laboratory methods. In addition, there is limited exposure to procedures employed in the care of critically ill patients. Faculty: Dr. Norman J. Robinson.

MEDI 448. CARDIOLOGY/CHARLOTTE MEMORIAL HOSPITAL (6). This is a selective rotation in cardiology. Student experiences will consist of coronary care unit patients, evaluation of cardiac patients in the emergency department, attendance at biweekly cardiology clinic, and optional participation in a very active invasive cardiology laboratory. The student will function as an acting intern. This will include call responsibilities every 3rd night. Faculty: Dr. Marvin McCall and various private cardiologists.

MEDI 449. CRITICAL CARE MEDICINE (6). The student will work in the UNC Hospitals Medical and Respiratory Intensive Care Units. Student responsibilities will include staying in the hospital every second night. The student will work directly as a member of the intensive care unit team in the evaluation and care of Medical Intensive Care Unit or Respiratory Intensive Care Unit admissions. The course will include review of experience in general medical and specialized respiratory intensive care. The student will be exposed to invasive hemodynamic monitoring techniques and mechanical ventilator management. Correlations between patient data physiology and pharmacology will be stressed. Faculty: Dr. James Yankaskas, Director, Respiratory Intensive Care Unit and Respiratory Intensive Care Unit Attending and Fellow staff.

MEDI 451. ACTING INTERNSHIP/FAYETTEVILLE/V.A. HOSPITAL (6). About 450 patients are admitted and 8,000 outpatients are seen monthly at this 345 bed general medical center which is staffed by 39 full-time physicians, and which is provided with advanced non-invasive Cardiology and Pulmonary Function Laboratories, a Neurology Section and Cardiology Section, a Hemodialysis Unit, etc. The student will work with an experienced general internist or a cardiologist, chest physician, gastroenterologist, hematologist, or endocrinologist, in a one-to-one relationship. Selected in and out patients will be assigned for work-up and management, for which the student will be given progressively increasing responsibility, in accordance with ability. Special emphasis will be given to the development of basic skills in history taking and physical examinations and, if a subspecialty is elected, to the techniques involved. Contact Dr. Sachs (488-2120, Ext. 7141) or Dr. Nuzum (966-2461) for further information. Faculty: Dr. Sachs, et al.

MEDI 452. RESEARCH IMMUNOLOGY/MOLECULAR BIOLOGY (24). This elective offers an opportunity for laboratory research experience in areas relevant to immunologic bases for human disease and immunopathogenesis of tissue injury: autoantibodies, complement system, lymphocyte surface receptors and lymphocyte subpopulations, cellular immunity, immune complexes, immunopathology, immunogenetics and immunoglobulin structure, molecular biology. Faculty: Drs. Winfield, Eisenberg, Cohen, Ross, Hunt.

MEDI 453. ALCOHOLISM: THE PHYSICIAN'S ROLE (6). This four week medical clerkship in a 28-day alcoholism treatment program features management of acute and chronic medical and psychiatric problems as they accompany alcohol and drug addiction and withdrawal states. Opportunity is also provided for participation in non-medical aspects of the recovery process. The course is designed to address AMA guidelines for physician involvement in early recognition and appropriate treatment of problems of alcohol and other drug abuse, emphasizing the matching of community resources to patients' needs, and the physician's responsibilities in prevention, diagnosis, early intervention, and case management. Faculty: Dr. Joyce C. Shaver.

MEDI 455. RESEARCH IN ENDOCRINOLOGY (6). This course is designed to give the student experience in the experimental approach to solving questions in basic or clinical endocrinology. During the elective the student will work closely with an individual faculty member on a research problem of mutual interest. Students will be expected to plan and carry out appropriate experiments or clinical studies, and to write a summary of the results. There will be ample opportunity to participate in conferences and seminars in the Endocrine Division. Faculty: Drs. Clemmons, Earp, Gray, Gwynne and Ontjes.

MEDI 456. INTERNAL MEDICINE/HALIFAX MEMORIAL HOSPITAL (6). Halifax Memorial Hospital in Roanoke Rapids, NC is a 190 bed general hospital located in a town of approximately 15,000. The student will be responsible for following the patient from admission to discharge, and will be given ample time for patient contact, including contact in the emergency room. The student may choose within the specialties of internal medicine from the following three tracks: (1) general internal medicine with experience in office, hospital, clinic and medicine consultation; (2) general internal medicine with experience in gastroenterology in the office practice, including experience in endoscopy; and (3) general internal medicine with experience in infectious diseases in the office, clinic, hospital and consultation. Opportunities can also be made available for the student to spend time in other health facilities within the community. Area L Rotation Coordinator: Wiley T. Ballance, M.A. (919-972-6958). Faculty: Drs. William Brown and Hector Manlapas.

MEDI 457. MEDICINE/WILSON MEMORIAL HOSPITAL (6). Wilson Memorial Hospital is a 388 bed hospital located across the street from two multi-specialty clinics in a rural county of 66,000 population. The student will gain experience in all phases of a multispecialty clinic practice and in the primary care of hospitalized patients. The student will have the opportunity to take supervised responsibility for his own patients and be permitted to perform or assist in technical procedures and professional activities at the discretion of, and under the supervision of the physician preceptor. A broad spectrum of rotation possibilities is available within the clinics and hospital including: Hospital Administration, Nursing Administration, Hospital Department of Social Services, Myocardial Infarction Rehabilitation Program—In Hospital, Learning Center-Patient Education, Utilization Review, Emergency Room, CCU—ICU, Cardiac Function Tests—ECG, Echocardiography, Stress Testing. Area L Coordinator: Wiley T. Ballance, M.A. (919-972-6958). Faculty: Dr. John McCain.

MEDI 458. CARDIOLOGY/MOSES CONE MEMORIAL HOSPITAL (6). This rotation is a preceptorship with one or more senior staff in cardiology. The student will participate in the work-up and management of hospitalized patients under the direct supervision of the resident and attending cardiologist. The student will have an opportunity to observe cardiovascular diagnostic procedures, study electrocardiograms with the cardiologist-interpreter, participate in consultations, attend the pediatric cardiology clinic, and spend some time in the private office of the attending cardiologist, participating in the management of ambulatory patients with cardiovascular disease. He/she will attend the general medical conferences and participate in Cardiology Rounds. Faculty: clinical faculty in Cardiology (12) Section Head: Dr. Thomas Stuckey.

MEDI 460. ENDOCRINOLOGY/MOSES CONE MEMORIAL HOSPITAL (6). This rotation is a preceptorship with one or more practicing endocrinologists. The student will function as an intern, performing initial work-ups and participating in management of patients under the supervision of a medical resident and a senior endocrinologist.

He or she will also accompany the resident and endocrinologist on consultations in the hospital, and may spend some time in the private office of the practicing endocrinologist participating in the evaluation and management of ambulatory patients. He or she will attend the general medical conferences and lectures and will participate in Endocrinology Rounds. Faculty: Dr. Robert Sevier and staff.

MEDI 461. INFECTIOUS DISEASES/MOSES CONE MEMORIAL HOSPITAL (6). This one-month rotation exposes the student to clinical infectious diseases. The rotation is under the direction of Dr. Timothy Lane and colleagues of the full-time faculty. The core of the experience will be consultations on hospitalized patients at Moses Cone Hospital and other hospitals in the community. The student will receive teaching from a medical resident, as well as the usual daily attending rounds and a series of didactic lectures designed to review and update the major topics in clinical I.D. The student will examine and present new patients to the attending and be expected to follow the progress of such patients through daily "work" rounds conducted in conjunction with the resident. Sessions in the bacteriology laboratory will be arranged so the student can become familiar with relevant microbiologic methods. A monthly infectious diseases conference and a monthly case management discussion will be the joint responsibilities of the student, the medical resident, and the attending. Faculty: Drs. Timothy W. Lane, Ward Robinson and John Campbell.

MEDI 462. HEMATOLOGY-ONCOLOGY/MOSES CONE MEMORIAL HOSPITAL (6). The student will be assigned selected patients with hematologic and oncologic disorders and will participate in their work-up and management under the direct supervision of the resident and attending hematologist-oncologist. The student may also spend some time in the private offices of practicing hematologists-oncologists and participate in the management of ambulatory patients. The student will attend the weekly hematology-oncology clinic, the general internal medicine conferences, and will participate in hematology-oncology rounds. Faculty: Senior Staff in Hematology-Oncology Section Head: Dr. William Herring.

MEDI 465. ACTING INTERNSHIP/WARD MEDICINE/UNC HOSPITALS (6). Students will serve as acting interns on the medical services of UNC Hospitals. They will assume the duties and responsibilities of an intern under the supervision of a medical resident and an attending physician. Night call is every third night. Students can expect to be exposed to a wide range of acute medical problems. This elective does not fulfill the requirements for an acting internship sponsored by the AHEC Program in a community hospital. Faculty: Department of Medicine, UNC Hospitals.

MEDI 466. OCCUPATIONAL LUNG DISEASE (6). The purpose of this elective is to broaden the students' experience in occupational lung disease by providing them with clinical or research opportunities. The student will work directly with faculty of the department who are involved in ongoing projects. When possible, the student will engage in independent work related to the faculty project or participate in field experiences in occupational medicine. The student will prepare either a written or oral report of the work completed at the end of the elective. Faculty: Dr. Brian Boehlecke.

MEDI 467. ADVANCED CARDIAC DIAGNOSIS (6). This course emphasizes the important role of historical and physical findings in the diagnosis of heart disease. Non-invasive studies including phonocardiography, pulse recordings, electrocardiography, chest x-ray and echocardiography will be used to elucidate bedside findings, particularly in patients with congenital and valvular heart disease. The goal of this elective is to provide an opportunity for the student to speak with and examine a large number of patients who have abnormal physical findings, correlate the non-invasive studies and through this process, improve their bedside diagnostic skills. Faculty: Dr. Park W. Willis and Cardiology faculty.

MEDI 470. AMERICAN MEDICAL EDUCATION AND ITS ACCREDITATION (6). Seminars, discussions and assigned reading about medical education in the U.S. and Canada; study of all accreditation survey reports collected for a quarterly meeting of the LCME; review of criteria for accreditation; participation in ongoing studies of medical education, e.g., content of clinical clerkships, rise and fall of integrated organ system teaching; licensure of physicians; new standards for accreditations, etc. Faculty: Drs. Mattern, Stritter.

MEDI 472. LEARNING PATIENT AND FAMILY PREFERENCES FOR LIFE SUSTAINING TREATMENT: A RESEARCH PRACTICUM (6). Second, third and fourth year students will help conduct a research project to learn what older patients' preferences are regarding the use of life-sustaining treatment toward the end of life, and whether we can incorporate these preferences more effectively into practice. Students will be taught research interviewing techniques and will read and discuss pertinent literature in medical ethics. Faculty: Dr. Marion Danis.

MEDI 473. (SURG 410) LIFELINE PROJECT (var.). Second year students will make visits to the homes of patients who sign up to participate in the Lifeline Project. They will take a medical history, do a write-up, present the case, and participate in follow-up. Faculty: Drs. Hansen and Trued.

MEDI 474. CARING FOR THE OLDER PERSON IN THE NURSING HOME (var.). This elective emphasizes the approach to the geriatric patient through direct hands on experience by seeing older people in an excellent local nursing home. Students will be expected to follow one or two nursing home residents for the year and will participate in clinical decisions with a trained geriatrician. Faculty: Dr. Mark E. Williams.

MEDI 475. HEART FAILURE (6). Heart Failure is one of the most common disease processes encountered in medicine today. This elective, precepted by Drs. Adams, Patterson and a cardiology fellow, will provide fourth year students the opportunity to learn diagnostic and therapeutic strategies in patients with advanced heart failure. Instruction will be largely independent self/study in nature with heavy emphasis on reading and the use of a lecture slide series. The student will participate in clinic on Tuesdays and Thursdays and will spend the balance of time working on research projects assigned by the preceptors. Faculty: Drs. Kirkwood F. Adams, Jr., and J. Herbert Patterson.

MEDI 477. LONGITUDINAL MEDICINE (6). The student can experience the longitudinal care of older adults. Possible settings for following patients as an acting intern with direct faculty supervision include: the Geriatric Evaluation Clinic at UNC Hospitals, Hillhaven Convalescent Center, and home visits with patients. Other possible activities including working with the Geriatric Consult Service and doing clinical research, will depend on student interest. Students can make arrangements with preceptors of other electives to spend time working with their assigned patients. Faculty: Dr. Mark E. Williams.

MEDI 478. INTRODUCTION TO REHABILITATION MEDICINE/MOSES CONE MEMORIAL HOSPITAL (6). Clinical clerkship offered at a 49-bed inpatient facility. The goal of elective is to offer an introduction to physical medicine and rehabilitation. Duties include supervised evaluation and management of inpatients. Daily attendance at rounds is expected, as well as attending team meetings and family conferences. Outpatient follow-up clinic, amputee clinic and EMG's/NCV's are required. Topics to be covered include musculoskeletal and neurologic exams; multidisciplinary team management of stroke, spinal cord injury and closed head injury; prescription of orthotics and prosthetics. Faculty: Dr. S. J. Pelligra.

MEDI 479. AMBULATORY MEDICINE/WAKE MEDICAL CENTER (6). Fourth year medical students will spend one month working at Wake Medical Center in the general medicine and walk-in clinics under the supervision of Wake AHEC faculty. Students will see acute and chronic care patients with an emphasis on preventive and continuity care. Other activities will include daily discussions with a faculty member on topics pertinent to outpatient medicine, and interactions with allied health professionals including social workers, nursing personnel, dietitians, and visiting home nurses. It is an unique opportunity for fourth year students to prepare themselves for the medical care of adult patients. Students will participate in routine medicine teaching conferences as time allows. Faculty: Dr. Mary C. Edmondson and AHEC faculty.

MEDI 480. EMERGENCY MEDICINE/HALIFAX MEMORIAL HOSPITAL (6). This rotation will introduce the student to the practice of emergency medicine in the community hospital setting. The student will be exposed to a wide variety of emergency problems and will become familiar with transfer policies. Faculty: Dr. Stewart Watson.

MEDI 481. PREVENTIVE CARDIOLOGY (6). The purpose of the course is to teach current skills in preventive cardiology and to foster research skills in preventive cardiology. The text for the course is *Preventive Cardiology* by Gary E. Fraser, Oxford University Press, 1986. It is expected that the student, in addition to meeting regularly with the course directors for directed readings in the field, will work with the group on ongoing preventive cardiology research projects. Depending upon the student's interests, motivation and previous experience, development of an individual research project is possible. Faculty: Drs. Ross J. Simpson, Jr., William McGaghie and Alice Ammerman, R.D.

MEDI 482. OUTPATIENT ADULT MEDICINE/MOSES CONE MEMORIAL HOSPITAL (6). This elective is a one-month experience in a busy adult outpatient clinic at Moses Cone Hospital in Greensboro. A "walk-in clinic" averages 400 visits per month apart from the continuity practices of the internal medicine residents and faculty. Two internal medicine residents each month and a full-time faculty member staff the walk-in clinic. The student will join this team and be given the opportunity to see patients with acute and chronic diseases, to learn principles of health maintenance, to improve interviewing and physical diagnostic skills, and to participate in conferences on ambulatory care topics. Close case-by-case faculty-student precepting and a scholarly approach to major outpatient problems are emphasized. Schedule permits attendance at all lectures and journal clubs of the Internal Medicine Training Program. Full-time faculty of Internal Medicine Training Programs.

MEDI 483. AIDS: PRINCIPLES, PRACTICE AND POLITICS (1–3). A diverse group of nationally known medical and social scientists will present lectures on the disease and the social, ethical and legal issues it has raised. This 3 credit seminar option is a combination of a graduate level interdisciplinary seminar and the lecture series designed to provide in-depth opportunity to explore social, clinical and biological components of the AIDS epidemic. Topics include: epidemiology of AIDS, biology of the virus, vaccine development, clinical manifestations and therapies, prevention and education, ethical and legal issues, and public policy. Faculty: Drs. Inge Corles (Nursing), Betty Dennis (Pharmacy), Bill Luckey (Public Health), Charles van der Horst (Medicine) and Ron Strauss (Dentistry).

MEDI 484. MEDICAL DECISION SUPPORT (6). This elective will explore clinical reasoning and how physicians can optimally combine information from textbooks, the literature, computers, and other sources. Students will analyze actual historical patient cases, consulting a variety of informational resources including a comprehensive electronic knowledge base and the medical literature. Using several important techniques from decision analysis, students will learn how to integrate the information derived from these varied sources. Further information can be obtained from Dr. McNutt. Faculty: Drs. McNutt, deBliek and Friedman.

MEDI 486. BASIC ASPECTS OF AGING (1). This course provides a comprehensive, multi-disciplinary perspective on various aspects of aging. The student will attend lectures on such topics as: metabolic bone disease, dizziness, hospice, hearing impairment, rehabilitation, physical and occupational therapy. Faculty from UNC will offer a series of weekly lectures (including discussions) on the above key topics in aging. Faculty: Dr. Mark E. Williams.

MEDI 487. GERIATRICS/NEW HANOVER MEMORIAL HOSPITAL (6). Students will participate in the care of hospitalized patients, follow out-patients in clinic, attend geriatric lectures, and have individual instruction with the attending five days per week. A comprehensive reading program will supplement the clinical experience. Consult rounds in a nursing/rest home facility are planned, as are home visits to patients with the attending. Faculty: Dr. Mary O'Brien.

DEPARTMENT OF MICROBIOLOGY & IMMUNOLOGY

Please refer to the departmental graduate course listing for further information on course offerings.

MCRO 105. MOLECULAR AND CELLULAR BASIS OF PROKARYOTIC MICROBIOLOGY (4). Basic concepts of the structure, metabolism, growth and reproduction, genetics and control and regulation of prokaryotes. Faculty: Dr. W. Cannon and staff.

MCRO 114. MICROBIOLOGY AND IMMUNOBIOLOGY (3). For students with a primary focus other than immunology. Immunochemistry; genetic control, regulation and development of cells and cell interactions; hypersensitivity, autoimmunity, resistance to infection. Faculty: Dr. John H. Schwab and staff.

MCRO 115. SPECIAL TOPICS IN MICROBIOLOGY AND IMMUNOLOGY (var.). This is a course designed to introduce students to research or diagnostic laboratory methods. Students may arrange with individual faculty members to supervise their program in the faculty member's laboratories or in various service laboratories. Projects may be of a research nature or may be devoted to the acquisition of special skills in laboratory microbiology. Faculty: staff.

MCRO 120. MICROBIAL PATHOGENESIS (4). Molecular and biological basis of pathogenic properties of bacteria. Faculty: Dr. Wyrick and staff.

MCRO 130. VIROLOGY (4). Current concepts of the chemistry, structure, replication, genetics, and natural history of animal viruses and their host cells. Faculty: Dr. J. Newbold and staff.

MCRO 210. TUTORIAL IN MICROBIAL CHEMISTRY (3). One or two faculty and a small number of students will consider in depth current research of importance. Emphasis will be on current literature, invited speakers, etc., rather than textbooks. Faculty: Dr. K. Bott and staff.

MCRO 212. TUTORIAL IN IMMUNOLOGY (3). One or two faculty and a small number of students will consider in depth current research of importance. Emphasis will be on current literature, invited speakers, etc., rather than textbooks. Faculty: staff.

DEPARTMENT OF NEUROLOGY

NEUR 402. NEUROLOGY RESEARCH (6). For those students who have an interest in pursuing research in the neurosciences, the Neurobiology program offers a mechanism to make arrangements for a block of time in research. The nature of the research activity, the responsible teacher, space, equipment, and supplies will be arranged individually for any student who wishes to pursue one or more blocks of time in research in the Department of Neurology. Faculty: to be determined.

NEUR 403. CLINICAL NEUROLOGY (6). Time will be divided between new patient work-ups in the Out-Patient Department, work-ups of selected in-patients, and experience in laboratory procedures relating to Neurology. The student will be assigned to the Neurologic Attending, who is responsible for the Neurology Out-Patient Department and the Neurologic Consultation Service. During the morning the student can be assigned to do complete work-ups on in-patients who are to be seen in neurologic consultation on any of several of the clinical in-patient services. Patients will be selected for their teaching value, so that the student with the help of the Attending will be able to pursue the specific clinical problem in depth. After the work-up the patient will be presented to the Attending who will be responsible for recommending subsequent management of the patient's neurologic problem. Faculty: Drs. Hayward, Farmer, Ehle, Greenwood, Hall, Howard, Messenheimer and Tennison.

NEUR 405. NEUROLOGY/MOSES CONE MEMORIAL HOSPITAL (6). This rotation is a preceptorship with a practicing neurologist. The students will participate in the work-up and management of hospitalized patients with neurologic disease under the direct supervision of a resident and an attending neurologist. The student participates in consultations with the resident and senior neurologist and will have the opportunity to observe diagnostic neurological procedures. The student may see patients in the private office of the attending neurologist and attend the general medical conferences and lectures at Moses Cone Hospital. Course Director: Dr. James Love. Faculty: clinical faculty in Neurology (5).

NEUR 410. (PEDS410) PEDIATRIC NEUROLOGY (6). A broad-based introductory course to the major clinical problems encountered in childhood neurology will be offered. There are two types of out-patient experience. The first involves the general Pediatric Neurology Clinic where there will be exposure to the problems of developmental disorders, learning disability, seizure disorders and other primary neurological diseases in children. In the Pediatric Epilepsy Clinic, an optional additional experience can be obtained for those wishing to work more closely with pharmacological and other aspects of seizure management. The student will be expected to participate actively in the weekly Pediatric Neurology Professor Rounds and in the biweekly didactic Pediatric Neurology Grand Rounds. Faculty: Drs. Greenwood, Tennison and staff.

NEUR 412. ACTING INTERNSHIP/NEUROLOGY (6). Students will serve as Acting Interns on the adult inpatient neurology service at UNC Hospitals. They will assume the duties and responsibilities of an intern under the supervision of a neurology resident and neurology attending. Night call is every third night. Students can expect to be exposed to patients with a wide variety of disorders of the nervous system. Faculty: Drs. Hayward, Hall, Mann, Howard, Messenheimer and Ehle.

NEUR 414. CLINICAL PAIN MANAGEMENT (6). Students work closely with members of the Multidisciplinary Pain Management Program in the assessment and treatment of patients with acute and chronic pain. Component clinics of the Pain Program include Neurology, Anesthesiology, Neurosurgery, Dentistry, and Physical Therapy. Emphasis is on the value of a multidisciplinary approach to pain problems, neurological and psychological assessment, dental pain syndromes, pharmacologic management of pain, diagnostic and therapeutic nerve blocks, biofeedback, and neurosurgical control of pain. Faculty: Drs. Mann, Lundeen, Wingfield, Hayward, Bell, Ghia, Toomey, Bullitt, Abashian and Turner.

DEPARTMENT OF OBSTETRICS & GYNECOLOGY

OBGN 402. MATERNAL-FETAL MEDICINE (6). The student will participate in the clinical, educational and research activities of the Division of Maternal-Fetal Medicine. Clinical activities will include ultrasound, antenatal diagnosis and genetic counseling, high-risk prenatal, and adolescent pregnancy clinics. Educational activities will include daily morning rounds at 7:30, afternoon attending rounds, genetics conference, ultrasound conference, OB/Neonatal conference, departmental case presentations, and grand rounds. Research activities will depend upon the laboratory studies in progress (the pregnant ewe model, fetal surgery, placental transfer and metabolism, etc.). The student will also do library research on a specific topic for oral presentation at the completion of the elective. Faculty: Dr. R.C. Cefalo, and staff.

OBGN 404. CLINICAL REPRODUCTIVE ENDOCRINOLOGY (6). Introduction to clinical reproductive endocrinology with Infertility and Endocrine clinics, conferences and small research project. Participation in vitro fertilization and surgical procedures. Faculty: Drs. Hammond, Hulka, Talbert, Clark, Shabinowitz and fellows.

OBGN 406. ACTING INTERNSHIP/GYNECOLOGY, UNC HOSPITALS (6). The student will participate on both the inpatient and outpatient gynecology service activities. The outpatient experience will include the work up of new and return patients in the gynecology clinic. The student will also follow patients admitted to the gynecology service and assist in the operations performed on those patients. The emphasis will be on the diagnosis and management of the most common gynecological problems, e.g., acute and chronic pelvis pain, pelvic infection, ectopic pregnancy, abnormal uterine bleeding, etc. Experience will also be gained in the management of menopausal symptoms and in contraceptive counseling. Faculty: Drs. William Droegemueller, Deborah Dotters and Linda VanLee.

OBGN 412. ACTING INTERNSHIP/GYNECOLOGIC ONCOLOGY (6). Students will work closely with the Chief Resident, Fellow and Attending in the Tumor Clinic and on the ward. They will be assigned selected patients to follow with supervision. They will also work in the Dysplasia Clinic held three hours each week. Students will observe and, when possible, participate in gyn cancer operations. They will also be encouraged to become involved in some projects in the Tumor Registry. Weekly review of pathology slides will be supervised. Faculty: Drs. Fowler, Walton, Moore and staff.

OBGN 414. ACTING INTERNSHIP/CAMP LEJEUNE, NC (6). The student's responsibilities on this elective will be split between Outpatient Gynecology and Obstetrics, with night call on the Obstetrics ward. The predominant time will be spent on the Outpatient Gynecology service seeing routine problems. The student will be able to participate in selected surgery cases as desired, and will participate in management of high risk Obstetrics patients. Faculty: staff of the Naval Medical Center.

OBGN 416. AMBULATORY OB-GYN/WAKE MEDICAL CENTER (6). This OB-GYN elective at Wake Medical Center will provide the medical student with learning experiences centered around ambulatory obstetrics and gynecology, the management problems most commonly encountered, and the diagnostic tests most often used. Time will be spent in the routine OB clinic, high risk pregnancy clinic and gynecology clinic. Faculty: Drs. Granados, Mulvaney and Tosky.

OBGN 418. ACTING INTERNSHIP/MATERNAL-FETAL MEDICINE/CHARLOTTE MEMORIAL HOSPITAL (6). This course is an introduction to the mechanisms of evaluation and management of those patients whose pregnancy is complicated by conditions that may compromise the health of the mother and/or fetus. Maternal and fetal physiology and pathophysiology will be emphasized. Learning experiences will include observation of the following antenatal diagnostic techniques: biophysical fetal evaluation utilizing ultrasonography and electronic fetal monitoring; amniocentesis for obtaining biochemical studies for fetal pulmonary maternity; and prenatal genetic evaluation techniques such as ultrasound directed amniocentesis and chorionic villus sampling. The student will also participate in both the didactic and clinical educational settings. Faculty: Dr. Ronald V. Wade and staff.

OBGN 419. ACTING INTERNSHIP/GYNECOLOGY/CHARLOTTE MEMORIAL HOSPITAL (6). During this Gynecology elective the student will participate in both didactic and clinical settings pursuant to an understanding of gynecological physiology and pathophysiology. Emphasis will be place on a thorough understanding of gynecological anatomy and embryology. The student will perform history and physical examinations on ambulatory and hospitalized gyn patients, under the auspices of the gynecological housestaff and attending staff. Active participation in clinical and teaching rounds will be encouraged. Attendance during pre-operative evaluation, surgery and post-operative care are required to emphasize total continuity of care. Observation of surgical techniques and discussion of the basis of the selection of gyn procedures will be stressed. A significant portion of the elective will include nonsurgical gyn conditions in the ambulatory settings. Faculty: Dr. Frank N. H. Harrison, Jr.

DEPARTMENT OF OPHTHALMOLOGY

OPHT 401. ADVANCED CLINICAL OPHTHALMOLOGY (6). During the fourth year students may spend four weeks in Ophthalmology, utilizing the inpatient and outpatient facilities of UNC Hospitals. A concentrated clinical exposure to general ophthalmology and selected specialities will be provided. The student is required to present a one hour seminar on a chosen topic in clinical ophthalmology at the end of the elective. Faculty: Drs. Eifrig, Wong, Grimson, Cohen, Kylstra and staff.

OPHT 402. RESEARCH IN OPHTHALMOLOGY (var.). The course will involve a supervised investigation into a pertinent problem in Ophthalmology. Research topics may involve aspects of intraocular lenses, glaucoma, corneal physiology, immunology, ocular physiology, or ocular biochemistry. It is anticipated that during the elective period the individual will become involved in department seminars and conferences as well as the laboratory work. At the end of the elective, the results of the study will be presented orally to the staff and residents and hopefully will warrant consideration for publication. Faculty: Drs. Eifrig, Wong, Grimson, Cohen, Peiffer, Kylstra, and staff.

OPHT 403. INTRODUCTION TO OPHTHALMOLOGY PATHOLOGY (2). Students will attend didactic lectures and seminars on eye pathology and learn gross and histopathologic interpretive skills. Faculty: Drs. Peiffer, Bouldin (Dept. of Pathology).

DEPARTMENT OF PATHOLOGY

Please refer to the departmental graduate course listing for further information on course offerings.

PATY 401. CLERKSHIP IN SURGICAL PATHOLOGY (12). The course provides instruction and experience in the examination and diagnosis of surgical pathology specimens, the processing of tissues, use of histochemical technics, and gross microscopic photographic technics. The student will be expected to participate in the daily activities of the department including the conference activities. Faculty: Dr. Askin and staff.

PATY 402. AUTOPSY CLERKSHIP (var.). This clerkship is equivalent to an acting internship in pathology with emphasis on anatomic pathology. Students will act as regular prosectors on the autopsy service, conduct gross and microscopic autopsy studies under supervision, and present their cases for discussion at staff seminars. Each student is expected to write full reports on 4 to 8 cases. One student for two consecutive elective periods each (8 cases), or one elective period (4 cases) followed by an elective in Surgical Pathology or Hematopathology. All reports must be completed by the end of the second elective period. Students are on call nights and weekends until they have assigned cases (usually first two weeks). Faculty: Dr. Dalldorf and staff.

PATY 403. CLERKSHIP IN HEMATOPATHOLOGY (6). A specialty elective designed to encourage special projects in Hematopathology. Student must arrange with faculty the nature of the project prior to approval for enrollment. Such projects include basic or clinical research in a specific problem relating to blood cells, or a coordinated morphologic elective following a Medicine or Pediatrics clerkship in Hematology. Faculty: Drs. Ross and Bentley.

PATY 404. CLERKSHIP IN BLOOD BANKING (6). The clerkship consists of: 1) orientation to the Blood Bank: tour, discussion of the qualifications and duties of staff; 2) structured discussion of the ABO system (characteristics of Ag-Ab, typing discrepancies, Bombay phenotype), Rh system (Fischer, Race, and Weiner classification, role in Hemolytic Disease of the Newborn), and classes of antibodies (characteristics, manifestations, clinical significance); 3) bench experience (typing, compatibility testing, antibody identification); and 4) supervised work up of clinical samples. Transfusion therapy is discussed in terms of indications, expected outcome, and hazards. Faculty: Dr. Collins and staff.

PATY 406. IMMUNOGENETICS (6). Laboratory experience in immunogenetics and analysis of families will be pursued. Regular meetings with the instructor will be held. Faculty: Dr. Reisner.

PATY 407. EXPERIMENTAL CARCINOGENESIS (var.). Exploration of factors concerned with the inception and natural history of neoplastic diseases. Pathogenesis, biological behavior, and response to therapy will be investigated by means of a combined experimental and seminar curriculum. The role of chemical agents, physical factors, viruses, and the modifying effect of genetic factors in the induction of cancer will be studied. Faculty: Drs. Grisham and Kaufman.

PATY 408. BLOOD COAGULATION (6). The Coagulation Consultation team composed of internists and Pathologists offers the elective in Blood Coagulation. Students are exposed to numerous patients with hereditary and acquired bleeding diseases, and hereditary and acquired thrombotic states. The elective is not only clinical, but correlates the clinical condition with laboratory abnormalities detected in the Clinical Coagulation Laboratory. Anticoagulant and fibrinolytic therapy is covered in detail. There are didactic lectures by the students and faculty, and the elective meets with the hematology and oncology consult services daily so there is interchange between all three services. Faculty: Dr. Harold R. Roberts.

PATY 409. IMMUNOHISTOCHEMICAL DIAGNOSIS OF SOLID TUMORS IN HUMANS (6). Immunoperoxidase studies in the last few years have revolutionized the practice of surgical pathology. The student will have the opportunity to learn this simple technique and how it is applied to the diagnosis of neoplastic diseases. The student will sit in on the morning surgical pathology conferences and can engage in a modest research project. For those individuals who would like to learn how to publish a research paper, a more substantial project can be arranged. Faculty: Dr. Gene P. Siegal.

PATY 411. RESEARCH IN PATHOLOGY (6). Independent research conducted under the supervision of a senior staff member. This elective is offered primarily for the benefit of students working on the combined MD-MS or MD-PhD program, but could be chosen by others who have a research project approved by a staff member. Faculty: Dr. Grisham and staff.

PATY 416. FORENSIC PATHOLOGY CLERKSHIP (6). This clerkship is equivalent to an acting internship in pathology with emphasis on anatomic pathology. Students will assist medical examiners at medical legal autopsies, and with the associated toxicological and legal aspects of particular cases. This experience should provide an opportunity to participate in all areas of medical-legal death investigations including the court room, as well as the pathology laboratory. Faculty: Dr. Butts and staff.

PATY 418. USE OF COMPUTERS IN MEDICINE AND LABORATORY MEDICINE (6). This elective is a basic introduction to the use of the computer as a tool in medicine and laboratory medicine. The student will have opportunity to use microcomputers with software likely to be of use in a physician's office and/or laboratory. Further, the student will be exposed to the problems of data acquisition in a real-time environment using a PDP 11/34 minicomputer. Students are expected to be able to use BASIC to meet simple programming needs, and also be able to use data base management software such as Lotus 1,2,3 Base II, etc. Computer time will be provided on an IBM PC or compatible personal computer. Students will be expected to use these or other software tools to develop a solution to a medical data processing problem of their choice. Faculty: Dr. John E. Hammond and staff.

DEPARTMENT OF PEDIATRICS

PEDS 401. ACTING INTERNSHIP/MOSES CONE HOSPITAL (6). Students will have the opportunity to function as first year residents on the Pediatric ward of a moderate size community hospital. Students will have contact primarily with hospitalized patients, but will also get experience working with ER patients. Ambulatory care assignments can be arranged. Procedures are supervised and orders countersigned by junior residents. The elective is ideal for students interested in a Pediatrics or Family Medicine residency. Faculty: faculty and attending pediatricians.

PEDS 402. PEDIATRIC CARDIOLOGY (6). The student will be exposed to various types of congenital and acquired diseases as they occur in children on the wards and in a variety of out-patient settings. Attempts will be made to help the student organize in a meaningful fashion the manifestations of anatomic and physiologic abnormalities of the cardiovascular system. The student will be expected to become proficient in physical diagnosis as related to the heart, as well as with the principles of electrocardiography, echocardiography and interpretation of cardiac X-rays. He/she will observe cardiac catheterizations and participate in the interpretation of the data obtained. Specific topics will be discussed in seminars. Faculty: Drs. Henry, Herrington, Frantz and Mattos.

PEDS 403. ACTING INTERNSHIP (6). The acting intern will function as all other interns on the Pediatric inpatient service do—taking admissions in regular sequence and taking night call every third night. Supervision will be provided by a third year resident and the attending physician. Faculty: Dr. Gerald Fernald and attending staff.

PEDS 404. ACTING INTERNSHIP/NEWBORN SERVICE INCLUDING NEONATAL INTENSIVE CARE/CHARLOTTE MEMORIAL HOSPITAL (6). This Acting Internship experience on the newborn service, including Neonatal Intensive Care Unit, is provided in a 841 bed teaching community hospital with approximately 300 deliveries per month, 48 term newborn beds, 35 neonatal intensive and intermediate care beds, and 22 recovery beds. Specific activities include the following: (1) direct patient care experience with the high-risk infant under direct supervision from pediatric residents and full-time faculty; (2) experience with resuscitation in the delivery areas and emergency stabilization of high-risk infants under direct supervision. Faculty: Drs. Rathbun, Hickey, Visser, Fischer, Kueser and Neal.

PEDS 405. INFECTIOUS DISEASES (6). Experience is provided in both the basic and applied aspects of childhood infectious diseases. Working primarily with the specialty residents and faculty consultants, the student may participate in: (1) daily outpatient clinic conference and ward rounds for review of cases and consultation services; (2) weekly infectious disease, chest and immunology clinics for evaluation and disposition of ambulatory patients; (3) clinical microbiology laboratory; (4) weekly chest, infectious disease and radiology conferences; and (5) limited research projects by special arrangement. The schedule enables insight into practical data and the theoretical basis of patient management. Faculty: Drs. Brown, Collier, Denny, Fernald, Henderson, Ingram, Weigle and Weber.

PEDS 406. PEDIATRIC PULMONOLOGY (6). This is a clinical elective in which the student will see in and out-patients on the Pediatric Pulmonary Service. The student will attend and participate in all conferences and journal clubs (7-8/week), see consultations along with the Pulmonary Fellow, attend all procedures on pulmonary patients (e.g., bronchoscopies), review and interpret pulmonary function tests on pediatric patients with the Fellow and Attending, and see selected new and return patients in the CF/Pulmonary Clinic. Faculty: Drs. Wood, Henry, Leigh, Retsch-Bogart, Boat and Fernald.

PEDS 407. DEVELOPMENTAL DISORDERS (CDL) (6). This elective focuses on both normal and abnormal child development. The student is an active member of the interdisciplinary teams which evaluate children and young adults with a variety of developmental problems (e.g., mental retardation, cerebral palsy, learning disabilities, etc.). The student learns about pediatric neuro-developmental assessment, differential diagnosis, and the management of individuals with handicaps. He or she also observes parallel methods of assessment and of therapy in psychology, speech, physical therapy, etc. Interpretation with families and community resources are among other issues considered. Faculty: Drs. Teplin, Sugioka, Coleman and Levine.

PEDS 408. PEDIATRIC HEMATOLOGY-ONCOLOGY (6). Exposure is provided to the theories and practices of clinical hematology and oncology with particular emphasis on pediatric problems. The diagnosis and management of both inpatients and outpatients will be studied. Conferences will be held regularly to discuss general and specific topics. This elective allows the development of special skills that are applicable to all areas of medicine, but at the same time allows insight into the specific problems of childhood cancer and hematologic disorders. Faculty: Drs. Cooper, McMillan and Wells.

PEDS 409. COMMUNITY AND AMBULATORY PEDIATRICS (6). This elective introduces the student to a spectrum of community and ambulatory pediatric problems. The student will evaluate children in the pediatric out-patient clinics (acute care and selected subspecialty clinics) and may spend up to a week seeing patients at a private practice in Sanford or Siler City. Also, there will be several assigned rotations with non-medical community agencies that serve children. Emphasis is placed on the comprehensive evaluation of children including medical, developmental, and psychosocial areas. Each weekday at 8:00 a.m. in the London Library, there is a one-hour conference for case discussions, with emphasis on acute care and frequent presentations of pertinent topics in ambulatory pediatrics. Office laboratory skills (with an emphasis on practical microbiology) are also covered. Students are urged to contact Community Pediatrics at least one month before the rotation, so that a schedule can be tailored to specific interest areas and transportation can be arranged if necessary. Faculty: Drs. Hamrick, Sharp, Garfunkel, Loda, Smith, Cross, Coleman and Runyan.

PEDS 410. (NEUR 410) PEDIATRIC NEUROLOGY (6). A broad-based introductory course to the major clinical problems encountered in childhood neurology. There are two types of out-patient experience. The first involves the general Pediatric Neurology Clinic where there will be exposure to the problems of developmental disorders, learning disability, seizure disorders and other primary neurological diseases in children. In the Pediatric Epilepsy Clinic an optional additional experience can be obtained for those wishing to work more closely with pharmacological and other aspects of seizure management. The student will be expected to participate actively in the weekly Pediatric Neurology Professor Rounds and in the biweekly didactic Pediatric Neurology Grand Rounds. Faculty: Drs. Greenwood, Tennison and staff.

PEDS 411. ACTING INTERNSHIP/NEONATOLOGY/WAKE MEDICAL CENTER (6). Hands-on experience, bedside instruction, and attending neonatal supervision around the clock for a very busy university affiliated tertiary perinatal program. In addition to routine technology, the A-I will be exposed to clinical trials, the latest in pharmacokinetics, neonatal pulmonary function, lactation education and developmental intervention and follow-up. University faculty and pediatric residents from UNC provide a team approach to care. This elective would be especially useful to prospective residents in pediatrics, obstetrics, family practice or anesthesia. It is offered every elective period. Same on call schedule as PL-1. Responsible to pediatric resident and attending neonatologist any given period. Faculty: Drs. Jim Thullen, Ross Vaughan, Tom Young and Laurie Dunn.

PEDS 412. (MEDI 412) ENDOCRINOLOGY (6). Extensive clinical experience is obtained with patients with endocrine disorders in the Medical Endocrine and Diabetes Clinics and in the Pediatric Endocrine Clinic. New patients are seen in the clinics and discussed with members of the Medical or Pediatric staff. Inpatients are seen on consulting rounds in the main hospital and in the Clinical Research Unit. Problem solving exercises are conducted on Tuesday and Friday afternoons with one of the faculty. Faculty: Drs. Ontjes, Gray, Van Wyk, French, Underwood, Earp, Gwynne, D'Ercole, Clemmons and Davenport.

PEDS 413. (MEDI 413) NEPHROLOGY (6). This elective will provide an in-patient and out-patient experience in the broad area of Nephrology, including a program of supervised reading and tutorial sessions designed to meet the interests and needs of the student. He/she may have the opportunity to learn about the special techniques of Nephrology including renal biopsy (along with an understanding of the indications and interpretation), the use of the artificial kidney, peritoneal dialysis, and common lab procedures. He/she will work in the Outpatient Department once a week and will work up approximately three in-patients a week. The supervisor will be the consultant assigned to Nephrology at that time. The student will be encouraged to find out from each member of the Division something of the nature of their research activities. Faculty: Drs. Morris, Conley, and Mesrobian.

PEDS 414. ACTING INTERNSHIP/NEONATOLOGY/UNC HOSPITALS (6). This course is intended to provide a supervised clinical experience in newborn critical care medicine, with tutorial support, to 4th year medical students. The experience will differ from that of the pediatric intern in the following ways: (1) patient load will be individualized; (2) additional technical and theoretical assistance will be provided by Junior Assistant Resident or Neonatal/ Perinatal Medicine Fellow/Attending as required; (3) selected bibliography will be furnished; and (4) tutorial sessions will be provided as needed. Faculty: Dr. Lawson and staff.

PEDS 416. ACTING INTERNSHIP/COMMUNITY PEDIATRICS/TARBORO (6). The student is responsible for the admitting history and physical evaluation on those patients who require admission and hospitalization. The student will also spend brief periods of time in a solo practitioner's office, the local mental health facility, the Edgecombe County Health Department, the Edgecombe County Social Service Office, as well as civic club meetings and a session of the Edgecombe-Nash Medical Society. The student is encouraged to view community problems as a whole and to formulate an approach toward improving a particular community situation. A final report is required. Faculty: Drs. Auten, Cutchin, Hemingway and Newton.

PEDS 418. PEDIATRIC CARDIOLOGY/CHARLOTTE (6). Students will participate actively in all phases of clinical pediatric cardiology. Patients are seen by the student with discussion of each case with the attending physician. EKG's and echocardiograms are interpreted daily, with the student becoming proficient at EKG interpretation. The student will make rounds with the attending twice daily. The student will participate in the heart catheterization laboratory to learn cardiac physiology. Operating room observation is available during surgery for congenital heart defects. Formal didactic sessions occur weekly, and guidance is given in reading the subject matter. The student will be acquainted with the anatomy and physiology of pediatric cardiac problems, recognition of pathological from innocent murmurs, learning preventive cardiology philosophy, interpretation of pediatric EKG's and dysrhythmias, and interpretation of catheterization findings. The student will also become acquainted in the care of critically sick children in an intensive care setting. Faculty: Drs. Donald A. Riopel and Richard T. Smith, Jr.

PEDS 419. COMMUNITY NEONATOLOGY—PERINATOLOGY/NEW HANOVER MEMORIAL HOSPITAL (6). A clinical rotation in the Neonatal Intensive Care Unit of New Hanover Memorial Hospital at Wilmington. Students will have ample opportunity to attend high risk deliveries, to be involved in resuscitation of the newborn, to take care of newborns with predominantly medical problems, to evaluate and stabilize neonates with surgical and cardiac problems before transfer. Faculty: Dr. Siew-Jyu Wong.

PEDS 421. PEDIATRIC ICU/UNC HOSPITALS (6). This is a clinical pediatric critical care elective designed to teach students how to recognize and manage critical illness in the non-neonatal patient. Pathophysiology, pharmacology and ethics are covered during rounds and a daily teaching conference. The student will examine and participate as fully as possible in patient evaluation and management, and will take every third night call with a pediatric houseofficer. Faculty: Drs. Zaritsky and Lawless.

PEDS 422. ACTING INTERNSHIP/NEONATAL ICN/MOSES CONE MEMORIAL HOSPITAL (6). Students have the opportunity to function as first year residents in the Neonatal Intensive Care Unit of a moderate size community hospital. The first week will include lectures on physiology and management of preterm and full term infants. During the remainder of the rotation, the student will care for patients that represent the more common conditions in the ICN. Procedures supervised and orders co-signed by attending neonatologist. Students will take night call with nurse practitioners assigned to the nursery. This elective is ideal for students interested in a Pediatric or Family Medicine residency. Faculty: Dr. Laurence Ransom, faculty and attending physicians.

PEDS 424. PEDIATRICS RHEUMATOLOGY/IMMUNOLOGY (6). Students in this course will participate in the care of inpatients and outpatients with rheumatologic and/or immunologic disease. Examples include juvenile rheumatoid arthritis, systemic lupus erythematosus, juvenile dermatomyositis, agammaglobulinemia, and combined immunodeficiencies. Students will be expected to evaluate these pediatric patients and formulate diagnostic and therapeutic plans with attending supervision. Physical examination of the musculoskeletal system will be emphasized. Students will participate in conferences and do extensive reading pertaining to rheumatologic and immunodeficiency disease. Faculty: Drs. Leonard Stein and Deborah Kredich.

PEDS 426. PEDIATRICS NEPHROLOGY (6). This elective utilizes the resources and faculties of the Divisions at Duke and UNC; it seeks to provide an approach to children with electrolyte or acid-base imbalance and with major conditions involving abnormal renal function. Self-instruction, supplemented by tutorials, emphasizes common (hematuria, proteinuria, urinary tract infection) and major (acute renal failure, chronic renal failure, nephrotic syndrome) conditions. Experience with outpatients and inpatients develops facility with performing and interpreting common diagnostic methodologies (urine sediment examination, creatinine clearance, protein and electrolyte excretions, radiographic studies.) Faculty: Drs. Morris, Conley, Smith , Scheinman and Wigfall.

PEDS 443. (MEDI 443) MEDICAL GENETICS (6). The objectives of this course are learning the clinical approaches and legal pitfalls to anticipating, diagnosing and counseling genetic disorders and malformation syndromes in medical practice. The student will participate in genetic consultations on the wards and in the clinics, and in the evaluation and counseling of patients (approximately 500 yearly) seen in the genetic counseling clinics. Supervised participation is also possible in the counseling and diagnosis of patients having antenatal diagnosis (approximately 600 yearly). The student may choose to make field trips to study a family and a genetic disorder, to read selected topics in medical genetics under supervision, or by special permission, to undertake a research project. Faculty: Drs. Aylsworth, Kirkman, Swift and staff.

DEPARTMENT OF PHARMACOLOGY

Please refer to the departmental graduate course listing for further information on course offerings.

PHCO 206. PHARMACOLOGY OF HORMONES AND VITAMINS AFFECTING MINERAL HOMEOSTASIS AND BONE METABOLISM (2). The course will offer an in-depth study of concepts and current research concerning the roles of parathyroid hormone, calcitonin, steroid hormones, and vitamins A and D in calcium homeostasis and bone mineral metabolism in health and disease. Emphasis will be placed on the control of secretion of the primary calcium regulating hormones (parathyroid hormone, calcitonin, and vitamin D metabolites), causes and consequences of altered blood levels of these hormones, and integration of their effects by the body to regulate mineral metabolism. Special consideration will be given to the roles of the hormones during pregnancy, lactation, growth and aging. Constituents of bone and body fluids that will be considered include calcium, magnesium, phosphate and the hormones themselves. This course should provide a foundation for the consideration of the pathophysiology and therapy of metabolic bone disease. Faculty: Dr. Anderson and Toverud (Directors); Drs. Gray, Hirsch, Munson, Ontjes, Peng, Talmage and Van Wyk.

PHCO 211. (6) PHCO 212. (6) INTRODUCTION TO PHARMACOLOGICAL RESEARCH. A course for first-year graduate students matching in Pharmacology. A series of research projects of limited scope, each pursued for an 8–10 week period under the supervision of a different faculty member. Faculty: Dr. Ray Dingledine and Barry Pallotta.

PHCO 301. RESEARCH IN PHARMACOLOGY (var.). Research project in Pharmacology. Faculty: staff.

PHCO 330. SEMINAR: RECENT ADVANCES IN PHARMACOLOGY (1). Students will meet as a group with faculty members to summarize and discuss the important current pharmacological literature. Faculty: Drs. John T. Gatzy and Barry Goz.

PHCO 331. SEMINAR: GENERAL PHARMACOLOGY (1). A series of weekly lecture-seminars by graduate students, faculty members and visiting scientists on current research in pharmacology. Faculty: Dr. Ken D. McCarthy.

DEPARTMENT OF PHYSIOLOGY

Please refer to the departmental graduate course listing for further information on course offerings.

PHYY 301, 302, 303 RESEARCH IN PHYSIOLOGY (3). Faculty: staff

PHYY 401. PHYSIOLOGICAL AND PATHOPHYSIOLOGICAL MECHANISMS ASSOCIATED WITH PAIN (6). Combined experimental and discussion format with considerable flexibility in the details. Participants can participate in an ongoing research project utilizing experimental animals and man or collecting material available from patients on the wards. Handling of data will be combined with directed reading. Possible topics include the relations between stimuli evoking pain and other sensations; alterations in pain sensibility in patients with organic disease; and new approaches to control of pain. Faculty: Drs. Perl and Light.

PHYY 404. NEUROCHEMISTRY OF SPINAL MOTONEURONS (6). The student will participate in ongoing research on isolated spinal motoneurons. The research is directed toward normal, regenerating and degenerating neurons and deals with the chemical changes underlying the abnormal states. Training will be offered in a number of techniques, including cell fractionation, electrophoresis of proteins, enzymatic and other quantitative assays of soluble and membrane-bound neuronal constituents. Faculty: Dr. McIlwain.

PHYY 407. SPECIAL TOPICS IN BIOMEDICAL ENGINEERING (3). Individual instruction in applications of biomedical computing or medical electronics to biomedical problems. Faculty: Dr. Coulter.

PHYY 410. RESEARCH ON MEMBRANE STRUCTURE AND FUNCTION (6). The primary objective of the elective is to introduce the student to current biochemical techniques used to study the structure and function of membranes. In particular, the student will participate in studies concerned with the sarcoplasmic reticulum membrane of skeletal muscle. These include: (1) isolation of sarcoplasmic reticulum by sucrose gradient centrifugation, (2) characterization of this cell organelle and derived membrane fractions by thin layer chromatography, polyacrylamide gel electrophoresis and by a variety of biochemical assays, (3) purification of the membrane components, and (4) reconstitution of a functional membrane from the purified sarcoplasmic reticulum proteins and lipids. Faculty: Dr. Meissner.

DEPARTMENT OF PSYCHIATRY

PSYY 404. CONSULTATION PSYCHIATRY (6). This experience emphasizes recognition and management of the psychological complications of medical and surgical illness. Patients with organic brain syndromes, classical "psychosomatic" illnesses as well as major psychiatric disorders are seen on the wards of the University of North Carolina Hospitals. Students may arrange to work on special services and outpatient clinics such as gastroenterology, gynecologic oncology, the Burn Center, AIDS clinic, etc. Individual supervision of patient care is provided by attending staff and advanced psychiatric residents. Students attend the rounds and conferences of the Consult service and are encouraged to make at least one clinical case report at a scheduled teaching conference. Faculty: Drs. Bakewell, Drossman, Gittelman, Graham, Lindsey, Perkins, Pisetsky, Sved and Taylor.

PSYY 410. PSYCHOPHYSIOLOGICAL RESEARCH (var.). A variety of research topics are available for either investigative efforts or as library projects. The primary theme will concern the effects of stress on cardiovascular activity and the relationship to the development of essential hypertension. The research can involve normal humans or humans with a labile blood pressure. This elective can involve any combination of time devoted to laboratory or library work. Current topics under study include responses to natural stressors assessed by ambulatory blood pressure monitors, interactive effects of high sodium intake and stress and the contribution of stress to the increased incidence of hypertension among black Americans. Faculty: Dr. Kathleen C. Light.

PSYY 411. INPATIENT PSYCHIATRY/DOROTHEA DIX HOSPITAL (6). This elective will provide the student with an intensive experience working with patients committed to a state psychiatric hospital. Students will be involved in all aspects (psychiatric and medical) of the treatment of patients with a variety of severe psychiatric illnesses. Supervision will be provided by the Senior Attending on one of the three admissions wards. Students will be expected to participate in all regular ward functions, as well as admissions/screening. Depending on patient population, students will be able to select the types of patients they wish to work with. Students should contact Dr. Jack Fritz, 218 Taylor Hall, Dorothea Dix Hospital, 733-5130, at least 3 weeks prior to the elective to make final arrangements. Faculty: Drs. Walker, Fritz, Dorfman and Ward Directors.

PSYY 412. GERIATRIC MEDICINE/PSYCHIATRY/DOROTHEA DIX HOSPITAL (6). The student will participate in the evaluation of both medical and psychiatric problems of geriatric patients, as well as formulation and implementation of treatment plans. Patients who present with or develop acute medical problems will be followed by the student on the Medical/Surgical Ward. Training goals will include: (1) learning to recognize the unique psychiatric problems of the elderly, (2) appreciating the interaction between the psychiatric and medical disorders, and (3) appropriately using medical/psychiatric drug therapy in the geriatric patient. Contact Dr. Mark Rowles at 733-0127 to make arrangements. Faculty: Drs. Mark Rowles and staff.

PSYY 418. FORENSIC PSYCHIATRY/DOROTHEA DIX HOSPITAL (6). This elective allows the fourth year student the opportunity to explore the challenging and often controversial interface between psychiatry and the criminal justice system. Students will work with a forensic psychiatrist doing pretrial evaluations, reporting on competency to stand trial and criminal responsibility. Short-term inpatient psychiatric treatment is also a part of the pre-trial evaluation process. The student will go to court and observe testimony of the psychiatric expert witness. Faculty: Dr. Bob Rollins and staff.

PSYY 420. CLINICAL RESEARCH UNIT/DOROTHEA DIX HOSPITAL (6). The Clinical Research Unit is a 20 bed unit consisting of patient dayroom and dormitory space, clinical and administrative offices and statistical, clinical and physiological laboratories. The major area of interest is in biological psychiatric research with special interest in the influence of endocrine substances in the etiology, pathogenesis and treatment of affective disorders, schizophrenia and alcoholism. Opportunities for Learning Experience: (1) scientific method in clinical research, (2) standardization of behavioral rating scales, (3) methods of statistical analysis of data, (4) participation in behavioral and physiological evaluations, (5) orientation towards the physiological interpretation of behavioral disorders, and (6) opportunity to conduct a specific research project. Faculty: Dr. J.C. Garbutt and staff.

PSYY 421. AUTISM AND RELATED DEVELOPMENTAL DISABILITIES (PSYCH. 307) (2). This seminar will cover 14 topics central to the understanding and treatment of autistic and developmentally disordered children. Focus is on two major perspectives: (1) the connection between normal development and developmental disabilities, and (2) the relationship between clinical or practical issues and basic research. Faculty: Dr. Eric Schopler and faculty with Division TEACCH of Psychiatry Department.

PSYY 424. DEVELOPMENTAL NEUROPSYCHIATRY (6). Students will work with hyperactive and autistic children, and adults and patients with severe epilepsy and closed head injuries, in the Neuropsychiatric Clinic at the CDL. They will visit regional centers for head injury patients and for the mentally retarded. They will work directly with behaviorally and emotionally disturbed children on the Children's Inpatient Psychiatry Service on 5 South, UNC Hospitals. The goal is to introduce medical students to the broad range of patients with neuropsychiatric disorders, with emphasis on differential diagnosis, medical approaches and treatment. Students will have direct patient responsibility on the Inpatient Unit; in the other areas they will work directly with Dr. Gualtieri. Faculty: Drs. Gualtieri, Chandler and Barnhill.

PSYY 429. COMPREHENSIVE CARE OF THE CHRONICALLY MENTALLY ILL (6). An AHEC sponsored elective, designed for the future non-psychiatrist M.D. who anticipates a general/family practice of medicine. Goals include achieving competence in treating selected mental disorders, plus acquisition of skills needed for elective collaboration with mental health specialists. Structured reading program and patient care responsibilities for effective disorders. Two days each in the psychiatric inpatient unit of small rural hospital and in the outpatient clinic. Fifth day negotiable; daily supervision by psychiatrist. Faculty: Dr. E. Drew Bridges.

PSYY 430. THE SOCIAL EXPERIENCE OF THE CHRONIC MENTAL PATIENT (Var.). In addition to the biologically determined handicaps of chronic mental illness, there are societal factors which influence access to the effectiveness of comprehensive treatment. Mechanisms of advocacy and coordination of services designed to address such factors are currently described under the literature of "Case Management." The student will function as part of the case management structure, spending time on an inpatient ward, in an outpatient clinic, and within a psychosocial rehabilitation program. Faculty: Dr. E. Drew Bridges.

DEPARTMENT OF RADIATION ONCOLOGY

RADY 414. RADIATION ONCOLOGY (6). Under the supervision of a preceptor, the student actively participates in the evaluation of patients referred to the department for consultation. The student has the opportunity to perform physical examinations on a large number of patients with a wide variety of physical findings. The student will correlate his findings with the radiological and pathological studies whenever applicable. The student will assist in formulating treatment strategies in conjunction with other oncologic specialties and will be involved in the technical aspects of treatment delivery. In addition, a large number of follow up patients will be seen and evaluated. The student is expected to attend multidisciplinary conferences and clinics. The student will become acquainted with the techniques of radiation therapy, the use of intracavitary and interstitial isotopes, and the use of computers for treatment planning. Faculty: Dr. Tepper and staff.

DEPARTMENT OF RADIOLOGY

RADY 401. GENERAL RADIOLOGY (6). The student will spend full time in the department with the attending and resident staff in various activities including film interpretation, fluoroscopic procedures, angiographic studies, imaging scans, conferences and lectures. This elective will familiarize students with how Radiology can help explore (or treat) a patient's problem, relative costs, benefits and risks of various studies. Each student will present a 30–45 minute talk on a medical problem emphasizing the radiologic evaluation. Faculty: Dr. Wilcox and staff.

RADY 402. EXTRAMURAL PRECEPTORSHIPS (6). Preceptorships in Radiology Departments of affiliated hospitals for one month can be arranged through the Chairman of the Department of Radiology of the Medical School. The preceptorship is designed to acquaint students with the daily community hospital practice of radiology and imaging. One student working and observing in the department during the elective period would be considered optimum. Faculty: Dr. Crane and staff (Durham), Dr. Fisher and staff (Cone), Dr. Black and staff (Charlotte).

RADY 403. PEDIATRIC RADIOLOGY (6). Conferences will be held, and practical work carried out, in diagnostic roentgenology as applied to pediatric problems. Faculty: Drs. Merten, Carpenter, Subermon and Scatliff.

RADY 404. NEURORADIOLOGY (6). Conferences will be held, and practical work in diagnostic roentgenology as applied to neurological and neurosurgical diseases will be carried out. Faculty: Drs. Whaley, Scatliff and Kooman.

RADY 407. CARDIOPULMONARY RADIOLOGY (6). The combined staffs of thoracic surgery, pulmonary medicine, and radiology participate in problem case study, discussion and treatment planning. Particular emphasis is given to the selection of patients for corrective surgical procedures. The evaluation of radiological studies of cardiac, vascular and pulmonary abnormalities is carried out by means of conferences, teaching file seminar, and participation during daily film reading sessions. A scholarly project will be required. Faculty: Drs. Parker and Wilcox.

RADY 411. FUNDAMENTALS OF INVESTIGATIVE RADIOLOGY (var.). This elective offers the opportunity to become involved in research in diagnostic radiology, working closely with faculty members. Research opportunities exist in laboratory exploration of animal models of human disease, in imaging techniques and perception, in biomedical and computer applications, and in clinical research areas. The student will be expected to prepare a protocol and carry out the research as far as time and interest allow. Prior consultation with appropriate faculty is required. Limited opportunities also exist for the student with an interest in radiologic physics to pursue projects in the fields of digital imaging and computer applications in radiology. Faculty: Drs. Clark, Mauro, Jaques, Parker, Johnston, Kwock, and Scatliff.

RADY 412. BONE AND JOINT RADIOLOGY (6). The elective is designed to give special emphasis to clinical problems in the diagnosis of bone and joint pathology. The student will participate fully in the daily work of the Bone and Joint Radiology Section, including film interpretation, consultation, and conference activities. This elective is offered to give added knowledge to those students anticipating a career in specialties dealing with bone and joint disease. Faculty: Dr. Renner.

DEPARTMENT OF SOCIAL MEDICINE

SOCM 403. READINGS AND PROJECTS IN SOCIAL MEDICINE (6). This elective allows a student to pursue studies of individual interest in some aspect of social medicine, by working closely with a member of the University faculty who is also interested in the same field of study. The medical student has the opportunity to arrange for elective study in any area, so long as it broadly relates medicine to society. Field work in the U.S. and other countries is encouraged. Readings and library work and regular conferences with faculty to review and discuss readings, and a major written paper of 10 to 25 pages on material covered in the course is required. Depending on the specific project and the availability of a faculty preceptor, this elective can be conducted during a four week elective period during the fourth year, or in the summer following the first year. Alternatively, it can run concurrently with the second year. Faculty coordinator: Dr. Donald Madison.

SOCM 405. MEDICAL CARE RESEARCH (Var.). Opportunities for participation in medical care research are available under the sponsorship of the Health Services Research Center and, in some instances, project directors in various schools of the Division of Health Affairs. Ongoing projects include new medical manpower experiments, services to rural areas without physicians, attempts to improve effectiveness of group practice, studies of the content of medical practices and practice pattern variations, and studies of patients' attitudes, etc. Opportunities will be provided, when possible, for students to investigate problems of special interest, even when not connected with ongoing projects. This course is designed to run concurrently with the second-year curriculum. Faculty: Dr. Gordon DeFriese.

SOCM 406. READINGS IN THE ECONOMICS AND POLITICS OF HEALTH CARE (Var.). This elective is designed as a tutorial for selected students with an interest in developing a background in health care. Field work in the U.S. and other countries is encouraged. Readings and library work, and regular conferences with faculty to review and discuss readings are required. A major written paper of 10 to 25 pages on material covered in the course is required. Faculty: Mr. Glenn Wilson.

SOCM 409. PROJECT IN EPIDEMIOLOGIC RESEARCH (var.). This elective concerns the application of basic principles of epidemiology to the design and conduct of studies concerning the description, explanation, prediction and control of disease and health problems in human populations. Students will either: (a) design an epidemiological investigation by developing the research protocol and writing a grant application, (b) participate in epidemiologic research studies ongoing in the Division of Health Sciences, or (c) where possible, conduct an original epidemiologic research project of interest under supervision. The project selected by the student should provide familiarity with some methods of epidemiologic design and analysis. A written presentation, a grant proposal suitable for submission, or a research study suitable for publication is required of all students. All students must be approved by the course teachers before enrollment. Faculty: Dr. D.K. Runyan.

SOCM 411. READINGS AND PROJECTS IN SOCIAL SCIENCES AND MEDICINE (4). This course is designed for students interested in the social sciences of anthropology and sociology. This is mainly a reading and tutorial course. Students may choose to study social science perspectives applied to topics such as: (1) poverty, health and illness, (2) comparative health and health care systems, or (3) treatment of mental illness in

North Carolina. Students selecting one of these areas would be expected to do reading and some fieldwork on the wards or in the community, as well as attend tutorial/seminar sessions. Those who want to study comparative health care would be expected to have had experience studying the health care system in another society. Faculty: Drs. Sue Estroff and Gail Henderson.

SOCM 414. READING IN EPIDEMIOLOGY AND HEALTH POLICY (1). This elective is designed to familiarize medical students with the contributions of the science of epidemiology to the study of health services and the formulation of health policies. The primary focus will be the impact of a particular service and medical procedures are considered, together with sociodemographic and economic characteristics, as independent variables affecting the level of health states. The following topics will be covered: health indices and diseases classification; sources of data for assessing health needs; research design and analysis; case examples of health promotion and disease prevention; coronary by-pass and computerized tomography; health care issues of selected diseases (such as coronary heart disease) and of selected segments of the population (such as mothers and children.) Faculty: Dr. Michel A. Ibrahim.

SOCM 415. PROJECTS IN MEDICAL LEGAL ETHICS (var.). This elective is designed for students with clinical experience or exceptional interest in medicolegal problems; it offers the opportunity to investigate particular topics in some depth. Chosen projects might include: research in law and policy on a given issue (e.g., Baby Doe, confidentiality); observing hearings on trials (e.g., malpractice, injury, involuntary commitment); or examining the functioning of institutional bodies (e.g., the Board of Medical Examiners, hospital child abuse teams). Extensive background and supplemental reading will be necessary for most topics. Pairing of students is encouraged, and regular conferences with faculty are required. A written presentation demonstrating understanding of legal and policy issues on the chosen topic, and relating those concerns to societal and clinical realities is required. Faculty: Nancy King, J.D.

SOCM 416. STUDIES IN THE MEDICAL HUMANITIES (6). This non-clinical course is for fourth year students who have completed the basic clerkships and most of their clinical electives. It is designed especially for students anticipating careers in academic medicine or leadership positions in medical practice settings. The elective is a month long "mini-semester" of graduate level coursework in ethics, history, and literature. Students will meet with faculty for approximately three hours each day in a seminar format. All students will study Medical Ethics and Philosophy, History of Medicine, and Medicine and Literature. The three are taught as separate courses, but a joint "correlative" seminar are held weekly. Students are encouraged to explore issues related to their specialty choices and to use their own clinical experiences as data for reflection and analysis. Faculty: Drs. Madison (Course Director), Churchill, Cross, Frey, King, Brandt and McVaugh.

SOCM 418. PROJECTS IN MEDICINE AND LITERATURE (var.). This elective allows students to pursue interests in literature, theater, creative writing, and performance in the context of the medical humanities. Students will perform with the Medical School's Staged Readings Company, preparing works of theater for public performance in communities around the state, and taking part in post-performance discussions of social medicine issues with audiences. Students will be required to research and discuss the humanities and social science content of the issues raised by the works read, and to keep a journal of readings and ideas. Students will also work with a faculty to develop original writings, to adapt literature for performance, and to prepare full theatrical productions of some works. Faculty: Nancy King, J.D.

DEPARTMENT OF SURGERY

SURY 401. ACTING INTERNSHIP/SURGERY A (6). This elective provides the student with an experience comparable in many respects to that of a first year surgery resident. It is designed to complement the junior year surgical clerkship by offering increased responsibility in patient care and management for patients having both surgical and non-surgical diseases. Emphasis will be placed upon understanding basic mechanisms and pathophysiology of disease processes, clinical evaluation of patients with surgical problems, and rationale for therapy. An opportunity will exist for some specialization in gastrointestinal diseases, neoplastic diseases, and surgery for endocrine diseases. Participation in the weekly outpatient clinic, clinical rounds, and conferences will be in conjunction with housestaff and attending physicians. This elective is recommended for the student considering postgraduate education in Surgery. Faculty: Drs. Croom, Herbst, Huth, Koruda and Thomas.

SURY 402. (MEDI 409) EMERGENCY MEDICINE/SURGERY (6). This elective offers a broad exposure to a variety of medical and surgical problems that commonly present to the UNC Hospitals Emergency Room. The student will evaluate patients, perform appropriate diagnostic studies and assist with common outpatient and emergency procedures, in close conjunction with the house staff and attending. Problems commonly seen include such entities as acute abdominal pain, fractures, soft tissue injuries, head trauma, myocardial infarction, asthma, diabetic emergencies, multiple trauma, etc. There is a twice weekly lecture series on relevant topics by the ER attendings, a course on common minor surgical subjects that includes suture technique instruction, and a weekly ER conference. The student is expected to work in the ER about 35–40 hours a week, rotating with other students in the ER. Students may also attend the EKG course which meets three times a week. Faculty: Emergency Medicine full-time attendings, Surgery and Medicine attendings.

SURY 405. ACTING INTERNSHIP/GENERAL AND TRAUMATIC SURGERY (6). During a one month period the student will be assigned duties of patient care similar to those of an intern. He/she will work with the intern during the days and will alternate nights and weekends taking first call. The student will be exposed to methods of management of general and traumatic surgical problems, and at the completion of the rotation will be expected to write orders, change dressings, care for wounds, perform cut-downs, and assist at surgery. Areas of reading will be suggested, and the rotation will be conducted under the supervision of the chief resident and attendings on this service. Faculty: Drs. Proctor, Mandel, Myer, Rutledge and Sheldon.

SURY 406. PRECEPTORSHIP IN SURGERY AND TRANSPLANTATION (6). The student will work under the individual supervision of Dr. Mandel. Depending on student desires and patient material available, instruction in depth will be given in vascular surgery, trauma, general surgery, and transplantation. Clinical material will be those patients on Vascular and Trauma Surgery service. Faculty: Dr. Mandel.

SURY 407. ACTING INTERNSHIP/PRIVATE SURGICAL PRACTICE/ROCKY MOUNT (6). This is an acting internship in general surgery with either Dr. Davis or Dr. Todd in the setting of the mid-size North Carolina community. The student will have experience in presentation of cases, pre- and post-operative management, surgery problems and surgical assisting and suturing. Faculty: Drs. Frank Davis and Stuart Todd.

SURY 409. ACTING INTERNSHIP/SURGERY/NEW HANOVER MEMORIAL HOSPITAL (6). This elective is designed to offer the student an opportunity to obtain instruction in the management of general and allied specialty surgical patients from full time practitioners in the community. He/she will be assigned to a private surgeon or the chief resident and will have the opportunity to examine all patients, record findings for review by the attendings, and assist at operations. At appropriate times, the student will participate in the private physician's office practice, the facilities being located adjacent to the hospital. In addition to daily rounds and operations with the team, the student will attend and participate in all conferences related to surgery. There will be a daily Surgery Conference, Monday–Friday. Faculty: Drs. Maxwell, Clancy and associates.

SURY 410. (MEDI 473) LIFELINE PROJECT (var.). Second year students will make visits to the homes of patients who sign up to participate in the Lifeline Project. They will take a medical history, do a write-up, present the case, and participate in follow-up. Faculty: Drs. Hansen and Trued.

SURY 412. ACTING INTERNSHIP/GENERAL, VASCULAR AND THORACIC SURGERY/VIRGINIA BEACH (6). A four week rotation at the General Hospital of Virginia Beach, under the direct supervision of four board-certified general and thoracic surgeons. Extensive clinical experience in the operating room, hospital (private) and office of an academically oriented surgical group practicing in a medium size community hospital is offered. Faculty: Drs. Clarke, Early, Morris and Ferguson.

SURY 413. ACTING INTERNSHIP/GENERAL AND THORACIC SURGERY/DURHAM GENERAL HOSPITAL (6). The student will have the opportunity to serve as an acting intern in a teaching hospital, which provides a wide spectrum of surgery required by a large community, plus more sophisticated problems which are referred in from this area of the state. The community setting provides a patient population, approach to diagnosis and treatment, and management of patients which differs from that seen in the medical center. The acting intern serves as a participating member of the surgical team under the supervision of the Duke residents and staff. The student has primary responsibilities for surgical patients, both on an inpatient and outpatient basis, and actively participates in a busy schedule of conferences, teaching rounds, and seminars. Familiarization with the literature concerning problems at hand is required and stressed. Faculty: Dr. Davis and Durham General surgical staff.

SURY 414. CLINICAL SURGERY/VETERANS HOSPITAL/FAYETTEVILLE (6). The student will be associated with an attending and will become involved in the care of his cases. Continuity of patient care is stressed by following the patient from the clinic through preadmission work up, admission studies, operative intervention and post-discharge clinic follow-up. Basic surgical principles including X-ray, laboratory, and pathologic data will be stressed through informal conferences and discussions. Students will be supervised in the performance of certain diagnostic and therapeutic procedures, formal conferences, and specific on-call responsibilities. The student may assume an active part in the treatment of patients with surgical emergencies. Faculty: Dr. Smith and staff.

SURY 415. GENERAL SURGERY/CHARLOTTE MEMORIAL HOSPITAL (6). Students will work as clinical clerks under supervision of house and attending staff, including a Director of Surgical Training. Work will consist of histories and physical examinations, observing and assisting with preoperative and postoperative treatment of hospitalized patients, and acting as a second assistant during operations on these patients. Students will work in the clinics, and, if desired, will be placed on a night call roster to assist house officers with nocturnal surgical activities. The practical experience gained will be complemented by regularly scheduled formal conferences and lectures, and by person-to-person instruction and discussion as the opportunities for the latter present themselves. Faculty: Dr. Walker and staff.

SURY 417. GENERAL SURGERY/BOONE (6). Drs. Lowell Furman and Richard Furman have an active private practice in general, thoracic and vascular surgery. The student will scrub on surgical cases in the morning and assist with office practice in the evening, as well as participating in evening rounds and emergency surgery on a selective basis. He/she will also be exposed to issues in surgery in third world countries due to the activity of the Drs. Furman traveling to foreign mission hospitals. Faculty: active staff of Watauga County Hospital

SURY 418. PEDIATRIC SURGERY (6). The student will be exposed to general pediatric surgery, which includes non-cardiac thoracic, and general abdominal surgery, oncology and neonatology. The student will participate in the initial assessment, perioperative surgical management and subsequent follow-up of pediatric surgical clinic, and will take an active role in this experience. Furthermore, the student will be given appropriate responsibilities on the ward for the pediatric surgical patients and be responsible to a Chief Resident and the Surgical Attendings. There will be didactic experiences in the form of conferences and lectures. Faculty: Drs. Azizkhan and Lacy.

SURY 420. ACTING INTERNSHIP/CARDIOTHORACIC SURGERY (6). The objectives of this course are: (1) to enable the student to identify those clinical parameters critical in caring for the acutely ill patient, and (2) to insure that the student can respond to the needs of such a patient in the appropriate clinical setting. During the rotation, the acting intern will work as an integral part of the house staff assuming responsibility commensurate with demonstrated ability. The student will be assigned patients for preoperative evaluation, operative experience, and post operative care. He/she will function as the responsible junior house officer for these patients, so that the attending staff may judge ability to identify and solve problems in the ward, operating room, and intensive care area. Faculty: Drs. Wilcox, Keagy, Mill and Starek.

SURY 421. RESEARCH ELECTIVE IN CARDIOTHORACIC SURGERY (12). The objectives of this research elective are: (1) to acquaint the student with the management and use of physiological and hemodynamic parameters utilized in the assessment, diagnosis, and prognosis of cardiothoracic disease; and (2) to teach the student modern mathematical and bioengineering methods to analyze the information obtained using on-line computers. This research period will provide "hands on" experience in instrumenting animals and measuring physiological responses to different stimuli. Faculty: Drs. Wilcox, Keagy, Mill and Starek.

SURY 422. ACTING INTERNSHIP/SURGICAL CRITICAL CARE (6). Students will act as regular members of the Critical Care Service for Surgery. Responsibilities will include work and teaching rounds, conferences and night call. The teaching will center on the pathophysiology, monitoring and pharmacology of the critically ill patient. Faculty: Drs. Meyer, Koruda, Proctor, Rutledge and Sheldon.

SURY 430. ACTING INTERNSHIP/NEUROSURGERY (6). The student will work up staff and private patients admitted to Neurosurgery, using the classical history and physical examination, with particular emphasis on the neurological history and physical examination. He/she will participate in the work and teaching rounds carried out by the division and will attend the outpatient clinic. The student will observe and assist at neurosurgical and neuroradiological procedures. He/she will also attend the following conferences scheduled within the Division: Neurosurgery Grand Rounds, Neuroanatomy-Neurophysiology Seminar, Gross Neuropathology Conference, Surgical (Histological) Neuropathology Conference, and Neuroradiology Conference. Faculty: Dr. Dacey and staff.

SURY 432. PRECEPTEESHIP IN NEUROSURGERY/DURHAM (6). The student will be associated on a one-to-one basis with the attending neurosurgeon, and will work up all interesting patients and follow through complete work-up, pre-op, operation, and post operative care. The main emphasis will be on good neurologic history and physical examination with differential diagnosis. There will be some work in EMG and neuro conduction studies if desired. Weekly grand rounds with adult neurologists, pediatric neurologists and other neurosurgeons, and neurology and neurosurgery conferences at UNC and Duke will be available. Faculty: Drs. Price and Kihlstrom.

SURY 433. RESEARCH IN NEUROLOGICAL SURGERY (6). The student will be permitted to select one of the ongoing neurosurgical research laboratory activities and to participate actively in any one of these areas of ongoing research: tissue culturing of brain tumors, immunological evaluations of brain tumor patients, hybridization techniques and monoclonal antibody studies, experimental regional brain ischemia, head trauma and laser surgery. Faculty: Dr. Dacey and staff.

SURY 440. ACTING INTERNSHIP/ORTHOPEDICS/UNC HOSPITALS (6). This program provides the opportunity to participate in the management of clinical musculoskeletal problems. The student will have only slightly less responsibility than the intern on the Orthopedic service. Instruction will be provided in: (1) examination, diagnosis, and treatment of musculoskeletal disorders, 2) casting, splinting, and traction techniques, (3) emergency care of major and minor injuries of the musculoskeletal system, (4) operating room technique and procedures in orthopedics and (5) pre- and postoperative patient care. Faculty: Dr. Wilson and staff.

SURY 441. ACTING INTERNSHIP/ORTHOPEDICS/WAKE MEDICAL CENTER (6). The acting intern shares the learning opportunities and patient responsibilities of the orthopedic resident staff. Depending on the objectives of the AI and his/her experience and talent, the amount of time in the emergency room, the outpatient clinics, private physician's offices, the operating room, and the library varies. All will do some of each. The AI will observe and participate responsibly in the care of outpatients and inpatients. Efforts are made to have the AI work in areas which fit best into his/her educational interests and needs. Flexibility exists in this rotation for such. AI's share call with a resident two nights each week while here. Faculty: Dr. Dameron and staff.

SURY 442. PRECEPTEESHIP IN ORTHOPEDICS (6). Students are associated on a one-to-one basis with an attending orthopedic surgeon. Students work up hospital admissions and present them to the attending for evaluation and further discussion. Students then follow these patients in the operating room, where they will have the opportunity to correlate preoperative findings with operative pathology. Follow-up and management of postoperative cases will be provided by making hospital rounds and attending outpatient clinics. Students attend the orthopedic conferences and seminars. Night or weekend work will consist of call when the attending is on for emergencies. Faculty: Dr. Wilson and staff.

SURY 444. PRECEPTEESHIP IN ORTHOPEDIC RESEARCH (12). Students are associated with one of the faculty members in the Orthopedic Research Laboratories. Specifically, the student will participate in or undertake a research project pertaining to the physiology, biochemistry or ultra-structure of bone. At the start of the period the student will work closely with a faculty member and/or their research staff, but will, as rapidly as possible, branch off into an independent research project. Time is provided for library study and attendance at seminars relating to research. Faculty: Drs. Wilson, Lester and staff.

SURY 445. PEDIATRIC ORTHOPEDICS (6). This elective is designed primarily for the student planning a career in Pediatrics, Orthopedics, or Family Practice. The student will attend weekly birth defects, hemophilia, children's foot and scoliosis clinics. In addition, he/she will have the opportunity to work up and follow pediatric inpatients on the orthopedic service. The student may also visit state crippled children's clinics during the month and attend all teaching activities relating to children's orthopedics. Reading will be encouraged and library time provided. Faculty: Drs. Greene and Henderson.

SURY 446. SPORTS MEDICINE (6). This program offers experience in the management of injury and illness in student athletes. The examination, diagnosis and treatment of students injured in athletic participation is stressed. Participation in the care of UNC intercollegiate, organized intramural, and free play recreational teams is offered. The Sports Medicine Elective is primarily an outpatient experience. The student has the opportunity to participate in on-the-field care, as well as treatment in the sports medicine rehabilitation units and the inpatient service. There is sufficient flexibility in this elective to tailor this experience to the individual student's long-term goal. Faculty: Drs. Taft, DeWalt, Tuttle and staff.

SURY 450. ACTING INTERNSHIP/OTOLARYNGOLOGY (6). The student serves as a regular member of the housestaff over a four-week period. Opportunities include personal instruction in review of the special techniques required for physical examination, observation of attending staff in their management of patients, and then the assuming of care for patients with access to consultation. The student assists at surgery and endoscopy and, in turn, is assisting in carrying out minor surgical operations. There is opportunity to participate in on-going research. Students are encouraged to spend time in the outpatient clinic. Faculty: Dr. Pillsbury and staff.

SURY 452. RESEARCH EXPERIENCE IN PHYSIOLOGIC—ACOUSTICS (var.). Bench research in neurophysiology of hearing. Faculty: Drs. Prazma, Henson and Hall.

SURY 460. PRINCIPLES OF RECONSTRUCTIVE SURGERY (6). This course will provide a broad exposure to all of the elements of plastic and reconstructive surgery. Students will be assigned directly to the attending surgeon and will participate in the examination, evaluation and treatment of patients both in the operating room, the Hand Rehabilitation Center, the Burn Unit, the general plastic surgical clinic and the Cleft Palate and Speech Rehabilitation Programs. Attending rounds and conferences within the Division, and additional seminar time will be provided throughout the elective period on the service. Faculty: Drs. Bevin, David and Lawrence.

SURY 461. REHABILITATION OF THE HAND (6). This course is designed to provide intensive concentration on hand conditions from the time of their occurrence through their operative and therapeutic course, including long-term follow-up in the Hand Rehabilitation Center. Students will be assigned with the attending surgeon to all hand cases admitted to the Plastic Surgery Service and will follow them throughout their course. The student will attend and participate in the Hand Rehabilitation Center rounds and conferences and will be provided with an extensive bibliography for independent study regarding hand problems. Opportunities for attending hand conferences at other centers will be provided on a limited basis. Faculty: Dr. Bevin and Hand Center staff.

SURY 462. THE BURNED PATIENT (6). Students will be assigned to the Burn Unit of the UNC Hospitals, where they will participate as members of the clinical team involved with the total management of burned patients. Experience will be provided and gained in the areas of physiological monitoring, the treatment of burns, bacteriology, drug therapy, and physical therapy of the burned patient. Participation in the acute, operative and chronic management of burned patients will be intensive. Opportunity for participation in on-going clinical and laboratory research projects is available and is encouraged. Faculty: Dr. Peterson and staff.

SURY 463. ACTING INTERNSHIP/BURN TRAUMA (6). The purpose of this elective is to provide the student with intensive experience in the care of the thermally injured patient. The student will function as the intern, not as a consultant. Specifically, he/she will perform the initial work-up on the patient and be responsible for his daily care, including surgery when feasible. Besides care of acutely ill patients, the student will be responsible for patients returning for burn reconstruction in order to maintain continuity of care. Faculty: Dr. Peterson and staff.

SURY 465. PLASTIC AND RECONSTRUCTIVE SURGERY/NEW HANOVER MEMORIAL HOSPITAL (6). This course offers intensive involvement in a busy plastic surgery practice (trauma, burs, hand, head and neck, congenital, esthetic, microsurgery) with 80–120 cases per month and 100 clinic visits per week. Students will gain OR experience, as first assistant in most cases, plus active participation in the emergency room. This course is an excellent introduction to private practice, with time divided between office and the 450 bed hospital. Faculty: Drs. Krohn and Nicks.

SURY 466. PLASTIC SURGERY/CHARLOTTE MEMORIAL HOSPITAL (6). To provide extensive emergency room and operative exposure to plastic surgical problems. The student will be on call with the UNC Plastic Surgery Resident assigned in Charlotte. Faculty: Dr. Chaplin and staff.

SURY 470. ACTING INTERNSHIP/UROLOGY (6). The student assumes the responsibilities of an intern on the Urology service, working under the close supervision of resident and attending staff. In addition to pre- and post-operative care, there is ample opportunity to learn basic endoscopic techniques. Faculty: Drs. Fried, Mesrobian and Tucker.

SURY 471. BASIC CLINICAL UROLOGY (6). Students work under the close supervision of the attending and resident staff two days a week in the Urology Outpatient Clinic. In addition to the clinic work, the students evaluate all consultations directed to the Urology service. Each consultation is then closely reviewed with a member of the attending staff. Students perform a number of basic urological procedures including cystoscopy, prostatic needle biopsy and urethral dilation. Faculty: Drs. Fried, Mesrobian, Mohler and Tucker.

SURY 472. LOWER URINARY TRACT DYSFUNCTION (6). Multidisciplinary evaluation, including invasive testing and analysis of patients with voiding dysfunction, incontinence and erectile dysfunction. Appropriate for 4th year students planning careers in OB/GYN, Urology, Family Practice, Internal Medicine, Neurology, Geriatrics or Psychiatry. Faculty: Dr. Tucker.

SURY 473. SEMINAR: SPECIAL TOPICS IN UROLOGY (0). A weekly seminar in which a wide range of urological problems are discussed in depth. Students will participate together with housestaff and appropriate references will be provided. Faculty: Drs. Fried, Mesrobian and Tucker.

SURY 474. RESEARCH IN UROLOGY (6). Students will be afforded the opportunity to carry out research projects under close supervision of the Urology staff. Faculty: Drs. Fried, Mesorbian, Mickey, Mohler and Tucker.

SURY 475. ACTING INTERNSHIP/UROLOGY/DANVILLE (6). This course includes office urology, as well as inpatient activities in a private practice setting, with members of the Danville Urologic Clinic and Urology residents from the University of North Carolina. The student will be assigned the duties and responsibilities of a junior house officer. Living accommodations and meals at the hospital as well as lunches at the clinic will be provided. Faculty: Drs. Andrews, Fehrenbaker, Ferguson, Hoffman, Landes, Lynch and Melnick.

SURY 476. ACTING INTERNSHIP/UROLOGY/WAKE MEDICAL CENTER (6). The student assumes the responsibilities of an intern on the Urology service at Wake Medical Center and works with the clinical Urology faculty at that institution. Faculty: Drs. Parnell, Lucey, Rhodes, Kane, Unger, Torora and Leet.

SURY 478. ACTING INTERNSHIP/PEDIATRIC UROLOGY (6). The student will assume the responsibilities of an intern on the Pediatric Urologic Service, working under the close supervision of the resident and attending staff. The student will participate in all weekly activities which include Pediatric Urologic Clinics, Combined Pediatric Urology/Pediatric Nephrology Clinics and Pediatric Rehabilitation Clinics. The student will also participate actively in pre and post operative care. There will be ample opportunity to perform selective surgical procedures under supervision. There will also be opportunity to perform clinical or basic research when the rotation is planned ahead of time. Faculty: Dr. Hrair-George J. Mesrobian.

SURY 480. COMPUTERS IN MEDICINE FOR RESEARCH AND CLINICAL PROBLEMS (6). This course is designed to provide the student with extensive experience in the use of all types of microcomputer software, including relational databases, spreadsheets, statistics, desktop publishing, graphics, word processing, on-line communications and their integration. A variety of data sources will be used to analyze data, develop a project and produce independent research publications. Hands on use of state-of-the-art microcomputers will be available throughout the course. Students are encouraged to apply. Faculty: Dr. Robert Rutledge.

EXTRAMEDICAL ELECTIVES

BMME 231. TECHNOLOGY IN HEALTH CARE DELIVERY (var.). This is a special tutorial course oriented toward particular topics in the application of technology to the delivery of health care. An intensive in depth study is offered on the use of biomedical computing, medical electronics or mathematical modeling in a particular area, jointly selected by student and faculty tutor. Faculty: Drs. Coulter, Hsiao and Lucas.

NUTR 110. APPLIED NUTRITION FOR HEALTH PROFESSIONALS (3). This course is designed for students interested in increasing their knowledge and understanding of the science of nutrition, and in applying this knowledge to the preventive and therapeutic care of man in a health-team approach. The lectures will provide information on the nutrients, nutritional requirements in health and disease, and food as it relates to our society and human welfare. Clinical and community application of the information will be provided through laboratory activities and actual experience in hospitals and community health care agencies. The course includes 42 one-hour lectures and 7 additional hours in laboratory. (This course may also be taken as a tutorial during fall or summer with permission of the instructor). Faculty: Dr. Anderson and staff.

PHYT 285. NEUROMUSCULAR PROBLEMS IN INFANTS AND CHILDREN (6). This course emphasizes the study of normal movement in children, and the problems which are consequences of neurological disorders. Acquaints students with both quantitative and qualitative assessments of motor development and early identification of problems. Current philosophies of treatment are explored through case studies, direct observation, experiential laboratory sessions and seminars. Opportunities are provided for practice, observation and interaction with therapists, educators, and families in a variety of community settings. Contact the instructor at least two months in advance to develop individual goals. Faculty: Dr. Darlene S. Slaton.

HPAA 174. GERIATRIC HEALTH AND MEDICAL CARE (3). This core course for the new Geriatric Education Center provides a comprehensive, multi-disciplinary perspective on the health care problems of the aged. The student will attend lectures and seminars on some of the following topics: Demography and Dependency of the Aged, Geriatric Assessment, Musculoskeletal Diseases/Falls, Mental Conditions, Skin Problems, Alzheimer's Disease, Physical and Occupational Therapy, Care Givers, Case Management, Home and Community Care, Reimbursement Issues, Death and Dying, Ethical Issues, Respiratory Disorders, Cardiovascular Disease, Incontinence, Depression, Neurologic Disorders, Drug Therapy/Compliance, Nutrition, Nursing Homes, HMO's and Hospice. Faculty from UNC and Duke will offer a series of fifteen lectures and seminars, including several discussion groups, on the above key topics in aging, presented Wednesday evenings from 6:00–8:30 p.m., Spring semester. Faculty: Dr. William Weissert.

The Department of Anesthesiology

The Department of Anesthesiology at The University of North Carolina is structured to meet the needs of patients for anesthetic care. Anesthesiology is defined as the practice of medicine dealing with, but not limited to, the provision of insensibility to pain during surgical, obstetrical, therapeutic and diagnostic procedures, and the management of patients so affected; the monitoring and restoration of homeostasis during the perioperative period, as well as homeostasis in the critically ill, injured, or otherwise seriously ill patients; the diagnosis and treatment of painful syndromes; the clinical management and teaching of cardiac and pulmonary resuscitation; the evaluation of respiratory function and application of respiratory therapy in all forms; the supervision, teaching and evaluation of performance of both medical and paramedical personnel involved in anesthesia, respiratory and intensive care; the conduct of research at the clinical and basic science level to explain and improve the care of patients insofar as physiologic function and the response to drugs is concerned; and the administrative involvement in hospitals and medical schools necessary to implement these responsibilities.

DEPARTMENT CHAIR

Robert W. Vaughan, M.D., University of Texas-Southwestern, 1966

PROFESSOR

J.N. Ghia, M.D., University of Bombay, 1961

E.R. Kafer, M.D., University of Sydney, 1970 M.B.B., University of Sydney, 1962, B.Sc., University of Sydney, 1959

K.J. Levin, M.D., University of Vermont, 1961, A.B., Dartmouth College, 1957

R.A. Mueller, M.D., University of Minnesota, 1965, Ph.D., University of Minnesota, 1966, M.S., University of Wisconsin, 1963

E.A. Norfleet, M.D., University of North Carolina at Chapel Hill School of Medicine, 1970, B.A., University of North Carolina at Chapel Hill, 1966

D.H. Sprague, M.D., Albany Medical College, 1969, B.S., Rensselaer Polytechnic Institute, 1965

R.W. Vaughan, M.D., University of Texas Southwestern, 1966, B.S., Southern Methodist University, 1962

ASSOCIATE PROFESSOR

B.C. Corke, M.D., University of Sheffield, 1961, F.A.A., Royal College of Surgeons, 1971 (Resigned June, 1989)

E.S. Mann, M.D., Cornell University, 1969, B.A., Swarthmore College, 1965

F.J. Spielman, M.D., Medical College of Georgia, 1978, B.A., State University of New York, 1972

ASSISTANT PROFESSOR

J.A. Anderson, M.D., University of North Carolina at Chapel Hill, 1984, D.D.S., University of Minnesota, 1973, B.S., University of Minnesota, 1973

A.G. Bailey, M.D., Southern Illinois University, 1980, B.S., University of Illinois, Urbana, 1977

J.A. Bechtoldt, M.D., Yale, 1961, B.A., Princeton University, 1957

E.W. Davidian, M.D., University of North Carolina at Chapel Hill School of Medicine, 1968, A.B., University of North Carolina at Chapel Hill, 1963

W.J. Lucas, M.D., University of Florida, 1983, D.D.S., University of North Carolina at Chapel Hill, 1973

C.W. Thomas, M.D., University of North Carolina at Chapel Hill School of Medicine, 1984, B.A., Wake Forest University, 1980 (Resigned January, 1989)

R.D. Valley, M.D., University of Virginia, 1980, B.A., University of Virginia, 1976

CLINICAL ASSOCIATE PROFESSOR

J.J. Aluise, Ph.D., University of North Carolina at Chapel Hill, 1982, M.B.A., West Virginia University, 1967, B.S., Wheeling College, 1964

E.C. Janowsky, M.D., University of California, San Francisco, 1965, B.S., University of California, San Francisco, 1962 (Resigned September, 1988)

E.P. Tyler, M.D., Temple University, 1979, B.S., Villanova University, 1975

CLINICAL ASSISTANT PROFESSOR

J.M. Thomas, M.D., Indiana University, 1985, B.A., Depauw University, 1981

CLINICAL INSTRUCTOR

S.J. Copeland, M.D., Ohio State University 1984, M.A., Ohio State University 1980, M.A., Ohio Wesleyan University,1978

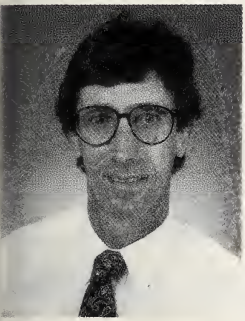
C.A. Murphy, B.A.E.D., Delta State College, 1960

VISITING ASSISTANT PROFESSOR

D.F. Appleton, M.A., Cambridge University, 1981, B.M.Ch.B., Oxford University, 1980

J.E. Peacock, (Resigned September, 1989)

The Department of Biochemistry and Nutrition



Faculty members in Biochemistry utilize chemical, physical and genetic methods, along with biological and computer modeling techniques to understand life. Areas of research within the Department include: molecular biology and chromatin structure; biochemical genetics of virus, bacteria, yeast and mammals; membrane structure and calcium transport; neurochemistry; physical biochemistry including fluorescent spectroscopy, X-ray crystallography, computer graphics and biophysics of macromolecules; hormones and their receptors; cytoskeleton assembly; enzymology and enzyme regulation; metabolic diseases as well as studies on the biochemical action of toxic agents and drug development. Although we teach nutrition, we do not have an active research program in this area. The research interests of the faculty are broad and listed in the graduate school catalog; detailed information concerning the research publications of our faculty is available in the American Chemical Society Directory of Graduate Research or can be obtained from the Director of Graduate Studies. Medical students can carry out limited research studies with individual faculty members, or they can participate in extended biochemical research in the MD/PhD program. Students in the combined MD/PhD program are required to complete 3 or 4 of the following courses (9 credit hours): Biochemistry 105, 108, 134, 144, as well as Biochemistry 205, (3 credit hours) and 4 credit hours in Biochemistry 207; Medical School courses can serve in lieu of electives. These course requirements can be completed within one year.

DEPARTMENT CHAIR

Michael G. Douglas, Ph.D., St. Louis University, 1974. (appointed 8/1/89)

Mary Ellen Jones, Ph.D. (Kenan Professor of Biochemistry and Nutrition), Yale University, 1951 (resigned as Chair 7/31/89).

PROFESSOR

M. Caplow, Ph.D., Brandeis University, 1963, D.D.S., New York University College, 1959

J.C. Carter, Ph.D., University of California, San Diego, 1972, M.S., University of California, San Diego, 1968, M.S., Yale University, 1967

C. Chae, Ph.D., University of North Carolina at Chapel Hill, 1967, B.S., Seoul National University, 1963

M.G. Douglas, Ph.D., St. Louis University, 1974, B.S., Southwestern University, 1967

D.T. Forman, Ph.D., Wayne State University, 1959, M.S., Wayne State University, 1957, B.S., Brooklyn College, 1953

E.B. Glassman, Ph.D., Johns Hopkins University, 1955, M.S., New York University, 1951, M.S., New York University, 1949

J. Griffith, Ph.D., California Institute of Technology, 1969, B.A., Occidental College, 1964

J. Hermans, Ph.D., University of Leiden, 1958, B.Sc., Groningen University, 1954 (Resigned March, 1990)

M.E. Jones, (Kenan Professor of Biochemistry and Nutrition) Ph.D., Yale University, 1951, B.S., University of Chicago, 1944

D.G. Kaufman, M.D., Washington University, 1968, Ph.D., Washington University, 1973, B.A., Reed College, 1966

B.R. Lentz, Ph.D., Cornell University, 1973, B.A., University of Pennsylvania, 1966

R.L. Lundblad, Ph.D., University of Washington, 1965, B.S., Pacific Lutheran University, 1961

G. . Meissner, Ph.D., Technology University, Berlin, 1965, M.S., Free University, Berlin, 1963, B.S., Free University, Berlin, 1961

P. Morell, Ph.D., Albert Einstein College, 1968, A.B., Columbia College, 1963

S.N. Nayfeh, Ph.D., University of North Carolina at Chapel Hill, 1964, M.S., American University of Beirut, 1961, M.S., American University of Beirut, 1959

R. Penniall, Ph.D., State University of Iowa, 1953, M.S., Knox College, 1950, M.S., Knox College, 1947

A. Sancar, M.D., Istanbul Medical School, 1969, Ph.D., University of Texas, Dallas, 1977, M.S., University of Texas, Dallas, 1975

G.K. Summer, M.D., Harvard University 1951, B.S., University of North Carolina at Chapel Hill, 1944

J.E. Wilson, Ph.D., Cornell University, 1948, M.S., University of Illinois, 1944, B.S., University of Chicago, 1941

R.V. Wolfenden, (Alumni Distinguished Professor of Biochemistry) Ph.D., Rockefeller Institute, 1964, M.A., Oxford University, 1961, M.A., Oxford University, 1958, A.B., Princeton University, 1956

ASSOCIATE PROFESSOR

F.E. Bell, Ph.D., Emory University, 1957, M.A., Emory University, 1953, A.B., Emory University, 1950

K.W. Burridge, Ph.D., Cambridge University, 1975, B.A., Sewlyn College, England, 1971

S.G. Chaney, Ph.D., University of California, Los Angeles, 1970, B.S., Duke University, 1966

P. Cheng, Ph.D., Case Western University, 1974, M.S., National Taiwan University, 1968, B.S., National Taiwan University, 1965

J.A. Cidlowski, Ph.D., Medical College of Georgia, 1975, B.A., University of South Florida, 1971

H.M. Fried, Ph.D., Cornell University, 1978, B.A., John Hopkins University, 1972

J.D. Holbrook, Ph.D., University of North Carolina at Chapel Hill, 1959, B.S., College of William and Mary, 1955

P.F. Maness, Ph.D., University of Texas, 1975, M.S., University of Texas, 1972

R.I. Swanstrom, Ph.D., University of California, 1975, B.S., University of California, 1971

T.W. Traut, Ph.D., University of Southern California, 1974, A.B., University of California, Berkeley, 1966

E.M. Wilson, Ph.D., Vanderbilt University, 1974, B.A., Ohio Wesleyan University, 1970

ASSISTANT PROFESSOR

A.H. Erickson, Ph.D., Mount Sinai School of Medicine, 1977, B.A., Wellesley College, 1969

L. Kalfayan, Ph.D., Brandeis University, 1982, B.A., Carleton College, 1975

B.J. Popko, Ph.D., University of Miami, 1984, B.S., Pennsylvania State University, 1980

G.B. Sancar, Ph.D., University of Texas, Dallas, 1977, M.S., University of Texas, Dallas, 1974, B.S., Baylor University, 1972

J.H. Vos, Ph.D., University Libre De Bruxelles, 1984, M.S., 1978, B.S., Brussels, 1974

RESEARCH ASSOCIATE PROFESSOR

K.C. Aune, (Director, Office of Information Systems) Ph.D., Duke University, 1968, B. Chem., University of Minnesota, 1964

J. Lin, Ph.D., Temple University, 1974, M.S., University of Chinese Culture, 1967, B.S., Tuanghai University, 1964

A.D. Toews, Ph.D., Ohio State University, 1974, B.A., Tabor College, 1970

RESEARCH INSTRUCTOR

F.A. Lai, Ph.D., University of London, 1985, B.Sc., University of London, 1981

F.R. Smith, Ph.D., Johns Hopkins University, 1985, B.A., Wesleyan University, 1979

CLINICAL PROFESSOR

B. Caterson, Ph.D., Monash University, 1975, B.S., Monash University, 1970

CLINICAL ASSISTANT PROFESSOR

D.M. Frazier, Ph.D., Duke University, 1969, M.P.H., University of North Carolina at Chapel Hill, 1983, A.B., Drew University, 1964

VISITING ASSOCIATE PROFESSOR

Q. Liu, B.S., Physics Department, Nankai University, 1962 (Resigned September, 1988)

CURRICULUM

Courses offered by the Department of Biochemistry and Nutrition are available to students majoring in other scientific disciplines, such as students interested in an A.B. degree in Chemistry or Biology, with emphasis on Biochemistry.

Courses for Health Professionals other than Medical Students

100. BIOCHEMISTRY FOR STUDENTS OF BIOLOGY AND CHEMISTRY (Neurobiology 100, Biology 107) (3). Prerequisites: one course in biology and two semesters of organic chemistry, at least one taken prior to this course. Lectures on the mechanism and regulation of reactions in living organisms, with emphasis on general principles. Protein structure and enzyme function; central pathways in intermediary metabolism; metabolic control; expression of genetic information; active transports; molecular disease. This course is equivalent to Chemistry 130 for the purpose of satisfying B.A. and B.S. course requirements for Chemistry majors. Fall. Erickson, Popko, Wolfenden.

100L. BIOCHEMISTRY LABORATORY (2). Prerequisite or corequisite: Biochemistry 100. Emphasizes modern research techniques in biochemistry, including subcellular fractionation, isolation, separation, and quantitation of biological macromolecules, enzymology, metabolic studies using radioactive precursors, clinical chemistry assays, and molecular biological techniques. 4 laboratory hours a week. Fall. Toews.

102. UNDERGRADUATE RESEARCH IN BIOCHEMISTRY (1–3). Prerequisites: an overall 3.0 GPA and permission of course director. For juniors and seniors who wish to carry out an independent, mutually arranged research project in the laboratory of a biochemistry faculty sponsor. Restricted to on-campus work. Minimum three hours per week for each unit of credit per semester. May be repeated. May not substitute for honors, advanced elective, or other course requirements of another department. A written report is required in each term. Fall and spring. Fried, Staff.

104. ENZYME MECHANISMS AND METABOLIC REGULATION (3). Prerequisite: Biochemistry 100 or equivalent. Selected metabolic pathways which illustrate how biochemical reactions are organized, catalyzed and regulated. Spring. Traut, Wilson, Wolfenden, Jones.

104L. ENZYME KINETICS (1). Prerequisite: Biochemistry 100 or equivalent. An analysis of enzyme-catalyzed multiple substrate reactions, and the kinetic characteristics of allosteric enzymes. Spring (1991 and alternate years). Jones.

105. MOLECULAR BIOLOGY (3). Prerequisite: Biochemistry 100 or equivalent. Mechanisms of replication, transcription, and translation of genetic material in prokaryotic and eukaryotic systems, gene sequence and organization, biochemical genetics, and regulatory mechanisms. Fall. Chae, Popko, Swanstrom, Vos.

108. LIPID AND MEMBRANE BIOCHEMISTRY (3). Prerequisite: Biochemistry 100 or equivalent. Chemistry and structure of complex lipids and lipoproteins; cellular fractionation; membrane structure, protein-lipid interactions, membrane fusion, transport and biogenesis; cytoskeletal membrane interactions and hormone mediated processes. Fall. Meissner, Lentz.

110. ADVANCED MOLECULAR BIOLOGY I (Microbiology 108, Genetics 110, Pharmacology 136, Biology 178) (3) Prerequisites: at least one undergraduate course in both Biochemistry and Genetics and permission of the instructor. DNA structure, function, and interactions in prokaryotic and eukaryotic systems, including chromosome structure, replication, recombination, repair and genome fluidity. Fall. Griffith, Sancar, Bedinger.

111. ADVANCED MOLECULAR BIOLOGY II (Microbiology 109, Genetics 111, Pharmacology 137, Biology 179) (3). Prerequisites: at least one undergraduate course in both Biochemistry and Genetics and permission of the instructor. RNA structure, function, and processing in biological systems including transcription, gene regulation, translation and oncogenes. Spring. Kole, Fried, Searles.

134. CASE STUDIES IN STRUCTURAL MOLECULAR BIOLOGY (3).Prerequisite: Biochemistry 100 or equivalent. Principles of macromolecular structure and function with emphasis on proteins, molecular assemblies, enzyme mechanisms and ATP enzymology. Fall. Carter.

139. HORMONES AND EVOLUTION (2). Prerequisite: Biology 53 or equivalent. An introduction to the chemistry of hormones and the biochemical mechanisms underlying their biological actions in an evolutionary perspective with emphasis on unifying concepts. Spring. Pearlman.

140. INTRODUCTION TO CHEMICAL PATHOLOGY (Chem Path 140) (3). Prerequisite or corequisite: Biochemistry 100 or equivalent. Permission of the instructor. Introduction to chemical pathology including the biochemical basis, methods of analysis, and clinical application of selected biochemical tests. Topics may include enzymology, endocrinology, clinical toxicology/pharmacology, immunochemistry or other related areas. 3 lecture hours per week. Spring (1991 and alternate years). Chapman, Silverman, Cross, Hammond, Forman.

142. BIOCHEMICAL TOXICOLOGY (Toxicology 142) (3). Prerequisites: Biochemistry 100, and one additional biochemistry course (or permission of course director). Biochemical actions of toxicants, and assessment of cellular damage by biochemical measurements. Course intended primarily for graduate students. Spring. Holbrook.

144. PHYSICAL BIOCHEMISTRY (3). Prerequisites: Biochemistry 100 and two semesters of physical chemistry. Theory and methods applicable to the study of biological macromolecules. Topics will include: macromolecules in solution, applications of random-walk theory, multiple equilibria, magnetic resonance spectroscopy and theory and applications of fluorescence spectroscopy. Three lecture hours per week. Spring. Hermans, Lentz.

180. DNA AND CELL PATHOLOGY (Genetics 180, Pathology 180) (3). Prerequisites: Biochemistry 100 and permission of the instructor. The basic chemistry of DNA and its associated structural and replicative proteins as it relates to mechanisms of mutagenesis and carcinogenesis. 3 lecture hours a week. Spring (1991 and alternate years). Topal.

Courses for Graduate Students

205. RESEARCH TOPICS IN BIOCHEMISTRY (3). Prerequisites: Biochemistry 100 or equivalent, and permission of the coordinator. Seminar and critical study of modern research topics in biochemistry under the supervision of individual biochemistry faculty. Spring. Nayfeh, staff.

206. EXPERIMENTAL APPROACHES TO BIOCHEMICAL RESEARCH (1). A survey of biochemical techniques in a lecture/demonstration format. Fall. Swanstrom.

207. ADVANCED BIOCHEMISTRY LABORATORY (2 or 4). Prerequisite: Biochemistry 100 or equivalent. Permission of the Department required except for departmental majors. Designed to introduce biochemistry graduate students to research methods. Minor investigative problems are conducted with advice and guidance of the staff. May be repeated for credit two or more semesters. Hours and credit to be arranged, any semester. Staff.

211. APPLICATION OF DIGITAL COMPUTERS IN BIOCHEMICAL RESEARCH (2). Prerequisite: permission of instructor. Introduction to use of computer graphics for molecular studies. Maximum number of students admitted will be determined by availability of equipment. Spring. Hermans.

220. BIOCHEMICAL ENDOCRINOLOGY (2). Prerequisite: Biochemistry 100 or equivalent. Review of endocrine systems and their clinical expression in disease; molecular mechanisms of hormone action; biochemical basis of growth factors and second messengers; recombinant DNA-cloning methods. Spring. Wilson, Nayfeh.

227. NEUROCHEMISTRY (Neurobiology 227) (3). Prerequisite: two semesters of Biochemistry. An introductory course in the biochemistry of the nervous system. Topics include aspects of energy metabolism, ion movements, neurotransmitters, intermediary metabolism and molecular biology in the nervous system. Fall (1990 and alternate years). Wilson, Morell.

228. ADVANCED TOPICS IN PROTEIN CHEMISTRY (Pathology 228) (3). Prerequisite: Biochemistry 100 or equivalent. Topics to be covered include the determination of the covalent structure of simple and complex proteins, including glycoproteins, site-specific chemical modification of peptides and proteins, advanced techniques for the purification and characterization of native and recombinant proteins. Spring (1991 and alternate years). Lundblad.

Seminar Series

The following seminar courses are designed for students who are majoring or minoring in biochemistry and who wish to further their knowledge in particular areas. Unless otherwise stated, two semesters of biochemistry are prerequisites for seminar courses. Most of these courses are given in alternate years by interested staff members. Unless otherwise stated, these seminars may not be repeated for credit. Seminar courses provide teaching experience which is required for a graduate degree in Biochemistry and Nutrition, in addition to experience in giving a critical review of the current literature.

230. SEMINAR IN MEMBRANE STRUCTURE AND FUNCTION (2). Prerequisites: Biochemistry 108 and permission of the instructor. Students organize and present in depth seminars in selected areas of modern membrane research. Spring (1991 and alternate years). Lentz, Meissner.

232. SEMINAR IN STRUCTURE AND FUNCTION OF CHROMATIN AND GENES (2). Prerequisite: Biochemistry 105 or equivalent. Covers the structural organization of chromatin and eukaryotic genes as well as regulation of gene transcription. Fall (1990 and alternate years). Chae, staff.

233. SEMINAR IN PROTEIN STRUCTURE AND FUNCTION (2). Students will read and discuss 4–6 papers per week related to enzyme structure, size, regulation, evolution, kinetics, isozymes, etc. Spring (1990 and alternate years). Traut.

234. SEMINAR IN PROTEIN BIOSYNTHESIS (2). Prerequisite: Biochemistry 105 or equivalent. Spring (1991 and alternate years). Bell, Chaney, Fried.

235. SEMINAR IN CHEMICAL NEUROBIOLOGY (Neurobiology 235) (2). Fall (1991 and alternate years). Wilson, Morell.

236. SEMINAR ON PROTEIN INTERACTIONS (2). Fall (1991 and alternate years). Hermans.

239. SEMINAR IN BIOCHEMICAL RESPONSE AND PROTECTIVE ACTIONS TO TOXIC SUBSTANCES (2). Discussions of current biomedical literature of the biochemical responses and protective actions to toxic substances by mammalian systems. Fall (1990 and alternate years). Holbrook.

240. SEMINAR ON METABOLISM OF GLIAL CELLS AND OF MYELIN (2). Prerequisite: any graduate course or medical school course in biochemistry. Spring (1990 and alternate years). Morell.

241. SEMINAR ON SPECIAL TOPICS IN BIOCHEMICAL RESEARCH (2). Covers areas of biochemical research that are currently active and productive. Specific subjects will be announced. May be repeated for credit. (Either semester as announced). Staff.

242. SEMINAR IN CLINICAL BIOCHEMISTRY (2). Prerequisite: permission of instructor. Current topics in clinical biochemistry including analytical methodologies and clinical interpretation. Summer. Silverman.

244. SEMINAR IN THE PHASE PROBLEM IN X-RAY CRYSTALLOGRAPHY (2). Prerequisite: permission of instructor. Image formation is treated from a quite general point of view, drawing from Fourier transform methods used in X-ray crystallography. Maximum entropy, maximum likelihood, and Bayesian estimation will be stressed. Two hour seminar a week. Spring (1990 and alternate years). Carter.

245. SEMINAR ON ONCOGENES (2). Role of oncogenes in cell transformation and development. Spring (1991 and alternate years). Maness, Swanstrom.

246. SEMINAR IN BIOCHEMICAL MECHANISMS OF ANTICANCER AGENTS (2). Prerequisite: one semester of biochemistry. Spring (1990 and alternate years). Chaney.

247. SEMINAR IN GLYCOPROTEIN STRUCTURE, BIOSYNTHESIS AND FUNCTION (2). Spring (1990 and alternate years). Cheng.

249. SEMINAR ON ENZYME REGULATION (2). Spring (1992 and alternate years). Jones.

250. SEMINAR IN BIOCHEMISTRY OF THE CYTOSKELETON (2). Spring (1990 and alternate years). Caplow.

251. SEMINAR IN DNA-PROTEIN INTERACTIONS (2). Review of current literature on kinetic and structural aspects of binding to DNA of proteins involved in replication, regulation, recombination and repair. Spring (1991 and alternate years). Sancar.

252. SEMINAR ON CURRENT TOPICS IN CLINICAL NUTRITION (2). Prerequisite: one semester of Biochemistry. Topics of current interest with respect to the role of nutrition in the prevention and/or treatment of disease with a strong emphasis toward understanding the underlying biochemical principles. Spring. Chaney, Frazier.

253. SEMINAR ON ARCHITECTURE AND MECHANISM OF ACTION OF ENZYME ACTIVE SITES (2). Techniques for investigating the 3-dimensional configuration of binding and catalytic centers experimentally; strategies involved in transition state stabilization by enzymes of different classes; design of mechanism-based metabolic inhibitors. Spring (1991 and alternate years). Wolfenden.

256. SEMINARS ON CURRENT TOPICS IN MOLECULAR DEVELOPMENT (Genetics 256) (2). Prerequisite: Biochemistry 105 or equivalent. Current papers in eukaryotic molecular development will be discussed in detail to explore the relations of gene structure, function and regulation during development. Spring (1991 and alternate years.) Kalfayan.

273. MOLECULAR MODELING (Medicinal Chemistry 275) (3). Prerequisites: Math 31, 32; Chem 181 (3). Introduction to computer-assisted molecular design, techniques and theory with an emphasis on the practical use of molecular and quantum mechanics programs (MM2; MNDO; GAUSSIAN). Spring. Bowen, Brooks, Cory J. Richardson, D. Richardson, B. Erickson, Pedersen, Hermans.

275. GENETICS SYSTEMS (Microbiology 275, Genetics 275, Biology 275, Pathology 275, Zoology 275) (3). An advanced course in genetics emphasizing the genetics and molecular biology of viruses, bacteria, fungi, insects and mammals and based upon the personal research of the staff. Required of all candidates for the degree in Genetics. Fall (1990 and alternate years). Staff.

301, 302. RESEARCH IN BIOCHEMISTRY (3 or more). Prerequisite: permission of the department. 6 or more hours a week, throughout both semesters, on demand. Staff.

310. RESEARCH IN NEUROBIOLOGY (Neurobiology 310, Pathology 310, Pharmacology 310, Physiology 310, Biology 310, Psychology 310) (3–12). Prerequisite: permission of the Graduate Student Advisor, Curriculum in Neurobiology. Research in various aspects of neurobiology. 6–24 hours a week, fall and spring. Faculty of the Neurobiology Program.

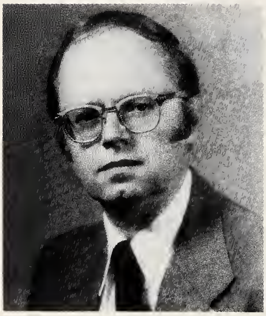
393. MASTER'S THESIS (0 or more). Staff.

394. DOCTORAL DISSERTATION (0 or more). Staff.

400. GENERAL REGISTRATION (0).

The Department of Cell Biology and Anatomy

The Department of Cell Biology and Anatomy teaches cellular and biostructural studies to graduate students and students of medicine, dentistry and other health-related professions and is committed to the generation of new knowledge through its research programs. Four first-year medical school courses are administered and taught by the Department: Cell Biology, Embryology, Histology and Gross Anatomy. Other specialty areas of teaching and research include: developmental biology, neurobiology, reproductive biology, endocrinology, auditory systems, cytochemistry, molecular biology and electron microscopy. The Laboratories for Cell Biology and the Laboratories for Developmental Biology are located in the Department, along with modern facilities for scanning, transmission, freeze-fracture and intermediate-high voltage electron microscopy; optical imaging of all kinds, including bright field, phase and fluorescence microscopy, and digitalized video microscopy; optical diffraction; fluorescence recovery after photobleaching; cell and tissue culture; autoradiography; immunocytochemistry; electrophysiology; radioimmunoassay; electrophoresis; HPLC; cell and organelle isolation; and membrane and protein fractionation. These facilities serve collectively as a center for advanced high technology in biostructural analysis for cellular and subcellular research. The department also hosts a large academic program of seminars, colloquia and international conferences in biostructure. These biotechnical and academic programs are open to medical students as well as other advanced students on the campus.



DEPARTMENT CHAIR

Charles R. Hackenbrock, Ph.D., Columbia University, 1966

PROFESSOR

C.R. Hackenbrock, Ph.D., Columbia University 1966, B.S., Wagner College, 1961

O.W. Henson, Ph.D., Yale University, 1964, M.A., University of Kansas, 1960, M.A., University of Kansas, 1957

K.A. Jacobson, Ph.D., State University of New York, 1972, M.S., University of Wisconsin, 1966, B.S., University of Wisconsin, 1964

M.C. Johnston, D.D.S., University of Toronto, 1954, M.S., University of Toronto, 1956, Ph.D., University of Rochester, 1965

W.E. Koch, Ph.D., Stanford University, 1962, A.M., University of Pennsylvania, 1959, A.B., University of Pennsylvania, 1956

J.M. Lauder, Ph.D., Purdue University, 1972, B.A., University of Maine, 1967

J.J. Lemasters, M.D., Johns Hopkins University, 1975, Ph.D., Johns Hopkins University, 1975, B.A., Yale University, 1969

E.K. Macrae, Ph.D., Columbia, 1946, M.S., Columbia, 1941, B.S., Bates College, 1940 (Resigned June, 1989)

M.G. O'Rand, Ph.D., Temple University, 1972, M.S., Oregon State University, 1969, A.B., University of California, Berkeley, 1967

P. Petrusz, M.D., Medical University, Pecs, Hungary, 1963, Ph.D., Karolinska Institute, Sweden, 1972

W.S. Pollitzer, Ph.D., Columbia University, 1957, M.A., Emory University, 1947, A.B., Emory University, 1944

A. Rustioni, M.D., Parma Medical School, Italy, 1965

T.W. Sadler, Ph.D., University of Virginia, 1975, B.Sc., Wake Forest University, 1971

W.E. Stumpf, M.D., Humboldt University, Berlin, 1952, Ph.D., University of Chicago, 1967

ASSOCIATE PROFESSOR

K.W. Burridge, Ph.D., Cambridge University, 1975, B.A., Sewlyn College, England, 1971

J.L. Carson, Ph.D., University of North Carolina at Chapel Hill, 1975, B.S., Western Carolina University, 1971

M.J. Costello III, Ph.D., Duke University, 1971, M.A., Duke University, 1967, B.S., George Washington University, 1964

N.A. Granger, Ph.D., Case Western Reserve University, 1970, A.B., Mt. Holyoke College, 1965

B. Herman, Ph.D., University of Connecticut, 1980, B.A., Adelphi University, 1975

L. Kwock, Ph.D., University of California, Santa Barbara, 1974, M.S., San Diego State College, 1968, B.S., San Jose State College, 1965

D.M. Lay, Ph.D., University of Chicago, 1968, M.S., Louisiana State University, Baton Rouge, 1962, B.S., Millsaps College, MS, 1958

R.L. Montgomery, Ph.D., West Virginia University, 1963, M.S., West Virginia University, 1960, A.B., University of Virginia, 1955

H.B. Peng, Ph.D., Purdue University, 1976, B.S., National Tsing Hua University, 1970

K.K. Sulik, Ph.D., University of Tennessee, 1976, B.S., Drake University Des Moines, 1970

ASSISTANT PROFESSOR

R.J. Weinberg, Ph.D., University of Washington, Seattle, 1983, B.A., University of Chicago, 1972

RESEARCH ASSOCIATE PROFESSOR

D.A. O'Brien, Ph.D., Harvard University, 1978, B.S., University of Dayton, 1972

M. Sar, Ph.D., Michigan State University, 1968, M.S., Michigan State University, 1963, M.S., Bihar University, 1956

RESEARCH ASSISTANT PROFESSOR

J.R. Abney, Ph.D., University of California, Berkeley, 1989, B.S., University of California, Irvine, 1981

B.N. Chazotte, Ph.D., Northern Illinois University, 1981, B.S., Bucknell University, 1976

J.D. Cortese, Ph.D., University of Buenos Aires, 1984, M.S., University of Buenos Aires, 1981

S.S. Gupte, Ph.D., Michigan State, 1977, M.S., University of Bombay, 1964, B.S., University of Bombay, 1962 (Resigned August, 1988)

E.S. Hunter, Ph.D., University of North Carolina at Chapel Hill, 1986, M.S., Old Dominion University, 1983, B.S., Hampden-Sydney College, 1980

P.A. Ordronneau, Ph.D., University of North Carolina at Chapel Hill, 1979, B.S., Loyola University, 1967

B.A. Scalettar, Ph.D., University of California, Berkeley, 1989, B.S., University of California, Irvine, 1987

RESEARCH INSTRUCTOR

B.A. Koch, Ph.D., Stanford University, 1966, M.A., Oxford University, 1961, M.A., Oxford University, 1958

VISITING INSTRUCTOR

L.G. Allen, Ph.D., East Carolina University, 1983, M.S., East Carolina University, 1980, M.S., University of North Carolina at Chapel Hill, 1975

W. Sun, M.S., Chinese Academy of Sciences, 1981, B.S., Tsinhua University, 1970

CURRICULUM

Courses for Health Professionals other than Medical Students

41. INTRODUCTION TO HUMAN ANATOMY (3). A general course primarily for persons preparing for careers as dental hygienists. 2 lectures and 2 laboratory hours a week. Fall. Montgomery.

92. HISTOLOGY (2). Study of the microscopic anatomy of fundamental body tissues. For students of physical therapy. 2 lecture and 3 laboratory hours a week for 9 weeks. Fall. Koch.

93. NEUROANATOMY (3). Prerequisite: permission of instructor. An introductory study of the central nervous system. Lecture and laboratory. For students of physical therapy. Spring. Montgomery.

105fs. GROSS ANATOMY (5). Systematic approach to gross anatomy emphasizing a regional approach in the fall and stressing head and neck in the spring. Primarily for dental students. Fall and spring. Montgomery.

111fs. MICROSCOPIC ANATOMY (3). Lectures and laboratory classes provide an understanding of the microscopic anatomy and histology of the basic tissues and major organ systems of the human body. Fall and spring. Peach.

124s. BIOLOGICAL SCIENCE LABORATORY (4). Primarily for students of dentistry. 8 hours a week. Spring. Staff.

191. GROSS ANATOMY FOR PHYSICAL AND OCCUPATIONAL THERAPISTS (Physical Therapy 191) (6). Prerequisites: Biology 11 and Biology 45 or equivalents and permission of instructor. Fundamental principles and concepts of human gross anatomy for physical therapists taught by lectures and cadaver dissection. Emphasis on functional anatomy. 3 lecture and 6 laboratory hours a week. Fall. Lay.

202ab. BIOLOGICAL ELECTRON MICROSCOPY (Dentistry 202ab) (2). Prerequisite: permission of instructor. Conference. 30 hours. Peach.

204. CONGENITAL MALFORMATION OF THE OROFACIAL REGION (Dentistry O.B. 204) (1). Prerequisite: permission of instructor. Spring. Staff.

207. REGIONAL ANATOMY (3). Prerequisite: permission of instructor. For students of oral surgery, surgical residents, graduate students. 2nd session, summer. Montgomery.

212ab. CYTOCHEMISTRY AND HISTOCHEMISTRY (Dentistry O.B. 212ab) (2). Prerequisite: permission of instructor. Hanker, staff.

222. SEMINAR IN STRUCTURAL AND HARD TISSUE PROTEINS (Dentistry O.B. 222) (1). Prerequisite: permission of instructor. Spring. Mechanic.

233ab. CURRENT TOPICS IN BASIC SCIENCE (Dentistry O.B. 233ab) (3,3). Primarily for dental students. Open to a few anatomy students with permission of instructor. Conference, 60 hours. Fall and spring. Staff.

Courses for Students in The School of Medicine and Open to Suitably Qualified Graduate Students

102. HUMAN HISTOLOGY (4). Prerequisites: Biology 21, 21L, Chemistry 11A, 11L, 21A, 21L, 61, 62; Physics 24, 25, or equivalent, and permission of instructor. Introduction to the study of cells, organized tissues and organ systems at levels of the light and electron microscopes with emphasis on human material. Fall. Lemasters, staff.

104. INTRODUCTION TO MEDICAL CELL BIOLOGY (1). Introduction to the structure and function of cell membranes, membranous organelles, the nucleus and the filamentous components of the cytoplasm. 6 lecture hours a week. Fall. Burridge, O'Rand.

107ab. GROSS ANATOMY (7). Prerequisite: permission of instructor. Primarily for medical students. Graduate enrollment limited by availability of space and material. 1 lecture, 6 laboratory hours, fall; 2 lectures, 6 laboratory hours, 8 weeks of spring. Henson, staff.

Courses Primarily for Graduate Students

101. NEUROANATOMY (3). Prerequisites: permission of instructor. Overview of the central nervous system: structure, connections and cell-to-cell interactions and communications. Fall. Rustioni.

106. THE CELL (3). Prerequisite: permission of the instructor. Comprehensive introduction to cell structure and function. Emphasis on membrane organization, organelles, the cytoskeleton, cell recognition and the regulation of cell growth including cancer cell biology. Jacobson, Burridge, staff.

109. HUMAN DEVELOPMENT (1). Overview of normal human embryological development from fertilization to parturition with an emphasis on the origin and causes of congenital malformations. 1.5 lecture hours a week. Fall. Sadler.

112. HUMAN ORIGINS (Anthropology 112) (3). An introductory survey of physical anthropology, including the place of man among the primates, human evolution, and racial differences. Consideration is also given to osteology and the inter-relationship of cultural and biological factors. 3 lecture hours a week. Fall. Holcomb.

115. HUMAN GENETICS AND EVOLUTION (Anthropology 115, Genetics 115) (3). Fundamental principles of genetics; population genetics; factors of evolution; race and species formulation; evolution of primates and man. The interaction of genetics and culture in human behavior, society, and evolution. 3 lecture hours a week. Spring. Pollitzer.

118. NEUROENDOCRINOLOGY (Pharmacology 118, Neurobiology 118) (2). Prerequisite: permission of instructor. A review of presently held concepts in neuroendocrinology with emphasis on topographical aspects of brain structures related to hormone action. Spring. (1988 and alternate years). Stumpf, Sar.

119. FUNCTIONAL ANATOMY OF MAMMALIAN REPRODUCTION (3). Prerequisite: permission of instructor. Structural and functional basis of mammalian reproduction, including sex differentiation, germ cells and fertilization, reproductive cycles, pregnancy and lactation and artificial control of reproduction. Spring (1987 and alternate years). Petrusz.

120. ADVANCED CHORDATE ANATOMY & BIOLOGY (5). Prerequisite: Biology 63. This course will consider vertebrate origins, diversity and evolution. The origins and evolution of the vertebrate classes are considered from the perspective of the anatomical and physiological problems encountered in the shift from one way of life to another. Fall. Lay.

121. DEVELOPMENTAL BIOLOGY (4). Prerequisite: permission of instructor. A comprehensive study of the mechanisms underlying morphogenesis (generation of form), including cell migration and other morphogenetic movements, cell interactions, cell differentiation and growth regulation. Spring. Sadler.

122. DEVELOPMENTAL NEUROBIOLOGY (3). Prerequisite: permission of the instructor. A comprehensive overview of nervous system development including detailed analysis of selected topics. Spring (1989 and alternate years). Lauder.

123. DEVELOPMENTAL TOXICOLOGY AND TERATOLOGY (Toxicology 123) (2). Prerequisites: basic biology and permission of the instructor. A review of aspects of development which are particularly susceptible to teratogenic insults. Mechanisms by which teratogens affect development will be emphasized. Spring (1989 and alternate years). Sulik.

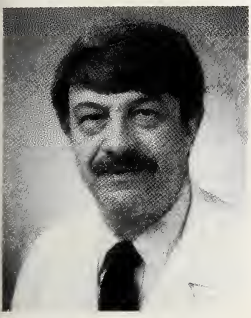
200ab. ADVANCED GROSS ANATOMY (4 + 4). Prerequisite: Anatomy 107 and permission of instructor. Detailed dissection of the human body. Specific regions may be selected; topics will include phylogeny and topographic and radiographic anatomy. 8 hours/week per region. Fall and spring. Henson.

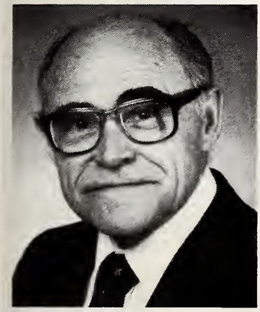
209. ELECTRON MICROSCOPY—PRINCIPLES AND APPLICATIONS (3). Lectures on scanning, transmission, high voltage, freeze fracture, analytical and immuno-electron microscopy. Laboratory training in preparation of biological specimens, operation of scanning and transmission microscopes and darkroom procedures. 3 lecture and 12 laboratory hours per week. Summer. Lemasters.

301. SEMINAR IN GENERAL ANATOMY (2). A series of weekly lecture-seminars by faculty members and visiting scientists on current research in anatomy. Fall (1988 and alternate years). Staff.

310. RESEARCH (2 or more). Credit to be arranged in individual cases. Fall, spring, summer sessions. Staff.

315. RESEARCH LABORATORY APPRENTICESHIP (3). Prerequisites: permission of instructor and enrollment in the Cell Biology and Anatomy Graduate Program. A course for first and second year graduate students in anatomy consisting of a research project of limited scope pursued under the supervision of a faculty member. Fall, spring, summer. Staff.





The Department of Dermatology

The mission of the Department of Dermatology is to do the best possible job of teaching, patient care, research and administration in areas concerning the skin and its diseases. Clinical teaching of medical students and residents takes place on the inpatient, outpatient, and consultation services of the University of North Carolina Hospitals and at various outlying clinics. Medical student teaching is largely done in the introductory course for sophomores and in the senior elective. There is emphasis on teaching of residents and continuing education for practicing physicians. Special clinical interests of faculty include skin cancers, bullous, viral, papulosquamous, acneiform and connective tissue diseases, eczemas and erythemas. Basic research includes epidermal-dermal relationships, structure and function of the epidermal-dermal junction, epidermal cell membranes, blister formation and leukocyte chemotaxis. Clinical investigation includes topical antibiotics for acne, topical corticosteroids for psoriasis and treatments for warts. Administration facilitates and provides a pleasant atmosphere for the above activities.

DEPARTMENT CHAIR

Robert A. Briggaman, M.D., New York University, 1960 (appointed 10/1/87)

Clayton E. Wheeler, M.D., University of Wisconsin, 1941 (resigned as Chair 9/30/87).

PROFESSOR

R.A. Briggaman, M.D., New York University, 1960, B.S., Trinity College, 1956

W.R. Gammon, M.D., University of North Carolina at Chapel Hill, 1971, B.S., North Carolina State University, 1967

E.J. O'Keefe, M.D., Yale University, 1966, B.A., Yale University, 1962

ASSOCIATE PROFESSOR

R.S. Tomsick, M.D., University of North Carolina at Chapel Hill, 1976, A.B., Kenyan College, 1971

D.T. Woodley, M.D., University of Missouri, 1973, A.B., Washington University, 1968 (Resigned August, 1989)

ASSISTANT PROFESSOR

M.J. Petersen, M.D., University of Utah, 1979, B.A., University of Minnesota, 1975 (Resigned June, 1989)

S.D. Resnick, M.D., Yale University, 1982, A.B., Brown University, 1978

J.T. Woosley, M.D., Medical College of Georgia, 1984, Ph.D., Medical College of Georgia, 1977, M.A., University of South Florida, 1973, B.A., University of South Florida, 1969

RESEARCH ASSISTANT PROFESSOR

M.L. Chiu, Ph.D., University of North Carolina at Chapel Hill, 1977, M.S., University of North Carolina at Chapel Hill, 1963, B.S., National Taiwan University, 1959

K.W. Rusenko, Ph.D.. Clemson University, 1986, M.S., State University of New York, Upstate, 1981, B.S., Syracuse University, 1973

CLINICAL PROFESSOR

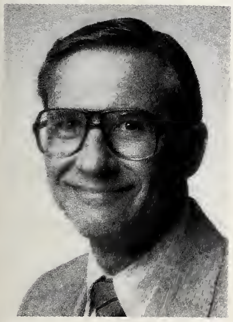
G.W. Crane,Jr., M.D., Northwestern University, 1945

J.C. Wheeler, M.D., University of Wisconsin Madison, 1941, B.A., San Mateo Junior College, 1938

VISITING RESEARCH ASSOCIATE PROFESSOR

S. Ono, M.D., Tokyo Medical and Dental University, 1979, Ph.D., Institute of Brain Research, 1986, B.S., University of Tokyo, 1972

The Department of Family Medicine



The Department of Family Medicine's goals are to educate family physicians to meet the needs of the state of North Carolina, to provide support for practicing physicians through development of educational programs and availability of consultation, and to give quality patient care through the Family Practice Center. The department also participates actively in the academic program of the UNC School of Medicine through teaching, research and other scholarly pursuits. The Department of Family Medicine has developed a statewide perspective including the Area Health Education Center Programs located in Asheville, Charlotte, and Greensboro. Teaching is also done in conjunction with a statewide network of family physician preceptors, and offers a variety of learning opportunities which introduce the principles of family medicine to all medical students. These opportunities also allow interested students to get more in depth experience in the specialty.

DEPARTMENT CHAIR

Kenneth G. Reeb, M.D., University of Wisconsin, 1963.

PROFESSOR

I.J. Bryan, M.D., University of Pennsylvania, 1957, M.P.H., University of North Carolina at Chapel Hill, 1966, B.S., Davidson College, 1953

P. Curtis, M.D., Royal College of General Practitioners, 1975, M.R.C., Royal College of Obstetrics-Gynecology, England, 1968

J.J. Frey, M.D., Northwestern University, 1970, B.A., University of Notre Dame, 1966

C.P. Friedman, (Director, Office of Educational Development) Ph.D., University of North Carolina at Chapel Hill, 1977, M.S., Massachusetts Institute of Technology, 1971, B.S., Massachusetts Institute of Technology, 1971

H.T. Frierson, Ph.D., Michigan State University, 1974, M.Ed., Wayne State University, 1970, B.S., Wayne State University, 1967

E.S. Mayer, M.D., Columbia University 1964, M.P.H., Yale University 1971, B.S., Tufts University, 1960

W.C. McGaghie, Ph.D., Northwestern University, 1973, M.A., Northwestern University, 1971, B.S., Western Michigan University, 1969

K.G. Reeb, M.D., University of Wisconsin, 1963, B.S., University of Wisconsin, 1956

R.T. Sakata, Ph.D., Kent State University, 1970, M.A., California State University, 1963, M.A., University of California, Berkeley, 1960

E.J. Shahady, M.D., West Virginia University, 1964, B.S., Wheeling College, 1960

F. Stritter, Ph.D., Syracuse University, 1968, M.A., Colgate University, 1961, A.B., St. Lawrence University, 1959

R.F. Walton, M.D., Kingston, Ontario, 1961

ASSOCIATE PROFESSOR

T.A. Cable, M.D., University of Florida, 1976

B.E. Cogswell, Ph.D., University of North Carolina at Chapel Hill, 1965, M.A., North Carolina State University, 1958, M.A., Goucher College, 1952, A.A., Stephens College, 1950

G.P. Guiteras, M.D., University of North Carolina at Chapel Hill, 1969, A.B., University of the South, 1965

R.E. Gwyther, M.D., Medical College of Ohio, 1975, M.B.A., Case Western Reserve, 1968, A.B., Adelbert College, 1966

A.R. Hansen, M.D., University of Iowa, 1977, Ph.D., University of Iowa, 1970, M.S., University of Iowa, 1968, B.S., Michigan Technological University, 1965

J.W. Lea, (Director, Office of International Affairs) Ph.D., University of North Carolina at Chapel Hill, 1973, M.A., Stetson University, 1965, M.A., Stetson University, 1964

J.P. Martin, M.D., University of Arizona, 1976, B.S., University of Arizona, 1972

P.R. Olson, M.D., University of Vermont, 1968, B.A., University of Massachusetts, 1964

P.J. Rizzolo, M.D., Creighton University, 1955, B.S., Seton Hall University 1951

P.D. Sloane, M.D., Medical College of Ohio, 1975, B.A., Pomona College,1972

ASSISTANT PROFESSOR

K.B. Fields, M.D., University of Kentucky, 1976, B.A., Yale University, 1971

W.A. Hale, M.D., University of Pittsburgh, 1974, M.S., Case Western Reserve University, 1986, M.S., Thiel College, 1970

W.A. Hensel, M.D., Ohio State University, 1978, B.A., Ohio State University, 1978

G. Strayhorn, (Assistant Dean for Academic Affairs) M.D., University of North Carolina at Chapel Hill, 1977, Ph.D., University of North Carolina at Chapel Hill, 1987, M.P.H., University of North Carolina at Chapel Hill, 1978, B.A., University of North Carolina at Chapel Hill, 1973

LECTURER

B.D. Skinner, M.A., University of California, Los Angeles, 1971, A.B., University of California, Los Angeles, 1969

L.M. Slatt, M.Ed., University of North Carolina at Chapel Hill, 1978, B.A., University of North Carolina at Chapel Hill, 1976

CLINICAL PROFESSOR

R.M. Baker, M.D., Case Western Reserve Ohio, 1965, A.B., Oberlin College, 1961

R.U. Florenzano, M.D., University of Chile, 1968, M.P.H., University of North Carolina at Chapel Hill, 1975, B.A., Instituto Nacional, Chile, 1960

CLINICAL ASSOCIATE PROFESSOR

J.J. Aluise, Ph.D., University of North Carolina at Chapel Hill, 1982, M.B.A., West Virginia University, 1967, B.S., Wheeling College, 1964

N. Berolzheimer, M.S., Florida State University, 1974, B.A., Tulane University, 1972

B. Hulka,

CLINICAL ASSISTANT PROFESSOR

A. Axelbank, M.D., Albert Einstein College, 1978, B.S., State University of New York, Albany, 1972

J.B. Beza, Ph.D., University of North Carolina at Chapel Hill, 1984, M.A., 1964, M.A., 1962

S.P. Bogdewic, M.A., University Santa Clara, 1977, B.A., Wheeling College , 1967

P.F. Dunn, M.S., University of North Carolina at Chapel Hill, 1984, B.S., State University of New York, 1980

C.L. France (Resigned June, 1989)

J.W. Furman, M.D., University of Cincinnati, 1978, B.S., University of Cincinnati, 1974

J.E. Klein, M.D., State University of New York, 1984, M.P.H., John Hopkins University, 1980, B.A., John Hopkins University, 1979

M.J. Marquardt, M.D., University of Minnesota, 1974, M.S., University of Missouri, 1982, M.S., Valparaiso, 1970

E.S. McConnell, M.S., Duke University, 1978, B.S.N., Duke University, 1976

M. Mintzer, M.D., McGill University, 1980, B.A., Wellesley College, 1973

I.A. Mooney, M.D., Emory University, 1974, B.S., 1970

S. Schooley, M.D., University of Massachusetts, 1980, B.A., Salem State College, 1975

J.R. Shackelford, M.D., Vanderbilt University, 1959, B.A., Vanderbilt University, 1956

A.C. Smith, Ph.D., University of North Carolina at Chapel Hill, 1986, B.A., Dartmouth College, 1968

R.W. Steiner, M.D., University of Louisville, 1973, M.P.H., University of North Carolina at Chapel Hill, B.S., Purdue University, 1966 (Resigned July, 1988)

CLINICAL INSTRUCTOR

R. DeBliek, Ph.D., University of North Carolina at Chapel Hill, 1987, M.Ed., University of North Carolina at Chapel Hill, 1976, B.A., University Toronto, 1974

J.P. Manor, M.D., University of Michigan, 1980, M.S., University of Michigan, 1975, B.S., Michigan State University, 1974

L.J. Mathew, M.P.H., University of Texas, 1980, B.S., Texas Woman's University, 1974

D.M. Mattingly, R.N., Kentucky Baptist School of Nursing, 1979

J.G. Potter, M.D., University of West Virginia, 1980, B.A., Michigan State University, 1975

S.F. Slatkoff, M.D., University of Pennsylvania, 1978, B.A., University of Pennsylvania, 1973

C.E. Staub, M.D., University of Rochester, 1984, B.A., Mount Holyoke College, 1980

G.A. Withrow, M.D., University of North Carolina at Chapel Hill, 1982, B.S., Duke University, 1975, B.A., Davidson College, 1970

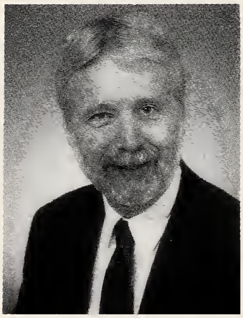
The Department of Medical Allied Health Professions

The Department of Medical Allied Health Professions has administrative responsibility for a variety of allied health professions. Currently, master's degree programs are offered in Occupational Therapy, Physical Therapy, Rehabilitation Counseling and Speech and Hearing Sciences. Baccalaureate degree programs include Medical Technology, Physical Therapy and Radiologic Science. Certificate programs include Cytotechnology, Radiation Therapy, Nuclear Medicine and Diagnostic Medical Sonography.

The Department of Medical Allied Health Professions provides students with opportunities for study in basic sciences and individual laboratory and clinical professions. The purpose of the DMAHP is to prepare clinicians, technologists and researchers in both theoretical and applied aspects of health care sciences.

Basic to this mission is the philosophy that the respective divisions and the Department exist:

- To generate new and innovative information relative to health care;
- To find effective ways to implement and disseminate health care information;
- To prepare health care professionals to promote health; to intervene in the disease processes, and to restore function through diagnostic, habilitation and rehabilitation services.



For further information about the application procedure contact your program of choice through the Department of Medical Allied Health Professions, School of Medicine, CB 7120, Wing E, The University of North Carolina, Chapel Hill, NC 27599-7120 (919-966-2343). Enrollment in undergraduate programs requires acceptance by undergraduate admissions, and enrollment in graduate programs requires acceptance by the Graduate School.

DEPARTMENT CHAIR

David E. Yoder, Ph.D., University of Kansas, 1965

ASSOCIATE CHAIR

Robert L. Thorpe, Ed.D., North Carolina State University, 1981

PROFESSOR

P. Leung, Ph.D., Arizona State University, 1970, M.A., Arizona State University, 1967, B.S., California Baptist College, 1963

M.M. Mitchell, Ph.D., University of North Carolina at Chapel Hill, 1968, M.S., University of North Dakota, 1964, B.S., University of Minnesota, 1955

R.U. Mitchell, Ph.D., Case Western Reserve University, 1970, M.A., Case Western Reserve University, 1961, B.S., St. Louis University, 1954

R.W. Peters, Ph.D., Ohio State University, 1953, M.A., Ohio State University, 1950, A.B., University of Minnesota, 1948

R.T. Sakata, Ph.D., Kent State University, 1970, M.A., California State University, 1963, M.A., University of California, Berkeley, 1960

D.E. Yoder, Ph.D., University of Kansas, 1965, M.A., Northwestern University, 1955, M.A., Goshen College, 1954

ASSOCIATE PROFESSOR

H. Cronenberger, Ph.D., University of Houston, 1972, M.A., Methodist Hospital, 1962, M.A., University of Texas, Austin, 1962

I.J. Hall, Ph.D., University of North Carolina at Chapel Hill, 1976, M.S., University of North Carolina at Chapel Hill, 1980, B.S., College of William and Mary, 1972

A.E. Hilger, Ph.D., University of South Carolina, 1974, M.S., University of South Carolina, 1969, A.B., Bellarmine College, 1966

B.R. Howes, M.S., Eastern Michigan University, 1971, B.S., Washington University, 1967

J.C. Keene, M.S., University of Cincinnati, 1971, B.S., St. Louis University, 1970

T.L. Layton, Ph.D., University of Nebraska, Lincoln, 1976, M.A., University of Nebraska, Lincoln, 1968, B.S., University of Nebraska, Lincoln, 1966

R.B. Mahaffey, Ph.D., Ohio State University, 1966, M.A., Ohio State University, 1963, M.A., Ohio State University, 1962 (Resigned June, 1989)

C.M. Nelson, M.A., Duke University, 1964, B.S., Richmond Professional Institute, 1951

P.B. Porter, Ph.D., University of North Carolina at Chapel Hill, 1980, M.A., Marshall University, 1972, M.A., 1971

C.P. Schuch, M.S., University of Pennsylvania, 1952, B.S., Cortland Teachers College, 1949

R.L. Thorpe, Ed.D., North Carolina State University, 1981, M.S., State University of New York, 1974, M.S., University of North Carolina, Charlotte, 1971

C.L. Wilhelm, Ph.D., Indiana State University, 1976, M.S., Indiana State University, 1973, M.S., St. Edward's University, 1972

ASSISTANT PROFESSOR

S.J. Beck, M.S., University of Minnesota, 1980, B.S., Moorhead St. University, 1975

C.B. Burns, M.S., University of North Carolina at Chapel Hill, 1982, B.S., University of North Carolina at Chapel Hill, 1978

E.R. Crais, Ph.D., University of Wisconsin, 1987, M.S., Vanderbilt University, 1974, B.S., University of Alabama, 1972

C.A. Giuliani, Ph.D., University of California, Los Angeles, 1985, M.S., University of California, Los Angeles, 1985, B.S., California State University, 1975, AA, El Camino College, 1973

M.T. Gross, M.S., University of North Carolina at Chapel Hill, 1983, B.S., University of Florida, 1979, B.A., Miami University, 1975

R.A. Humphry, Ph.D., Ohio State University, 1985, M.S., Colorado State University, 1979, B.S., San Jose State University, 1971

C.M. Kampfe, Ph.D., University of Arizona, 1984, M.A., University of Northern Colorado, 1968, M.A., Hastings College, 1967

V.A. Le Grys, Ph.D., Catholic University, 1982, M.S., Catholic University, 1980, B.S., Wake Forest University, 1977

K.E. Light, M.S., Medical College of Virginia, 1980, B.S., University of Missouri, 1974

M.J. McGuire, M.S., State University of New York, 1981, B.S., Ohio State University, 1976

C. Nielson, M.P.H., University of North Carolina at Chapel Hill, 1984, B.S., Medical College of Georgia, 1975

S.S. Ostby, Ph.D., University of Wisconsin, Madison, 1982, M.S., University of Arizona, Tucson, 1976, B.S., University of Arizona, Tucson, 1975

C. Parr, M.S., Boston University, 1969, B.S., Ohio University, 1959

W.E. Prentice, Ph.D., University of Virginia, 1980, M.S., University of Delaware, 1976, B.S., University of Delaware, 1974, B.S., University of North Carolina at Chapel Hill, 1974

J.B. Renner, M.D., University of Virginia, 1980, B.A., University of Virginia, 1977

C.L. Riegger, Sc.D., Boston University, 1986, M.S., Boston University, 1974, B.S., Ohio State University, 1971

J. Roush, Ph.D., University of Michigan, 1981, M.A., Western Michigan University, 1976, M.A., Western Michigan University, 1975

J.W. Sparling, Ph.D., University of North Carolina at Chapel Hill, 1987, M.S., University of North Carolina at Chapel Hill, 1982, A.B., Wellesley College, 1958

R.C. Stevens, M.S., State University of New York, Buffalo, 1971, M.A., University of Virginia, 1966, A.B., Meredith College, 1965

E. Taylor, Ph.D., Tulane University, 1984, M.Ed., University of Hawaii, 1980, B.S., Colorado State University, 1971

P.L. Witt, M.S., University of Massachusetts, 1974, B.S., University of Massachusetts, 1973

INSTRUCTOR

L.L. Moyle, M.A., Medical University of South Carolina, 1984, B.S., University of North Carolina at Chapel Hill, 1979

J.D. Rourk, B.S., University of Pennsylvania, 1960

J.A. Thomas, B.S., University of North Carolina at Chapel Hill, 1978

D.L. Wright, M.S., North Carolina State University, 1988, B.S., University of North Carolina at Chapel Hill, 1980

LECTURER

P. Gratale, B.S., University of North Carolina at Chapel Hill, 1983

L.D. Keith, M.S., University of North Carolina, 1985, M.S., Virginia State University, 1976, B.S., North Carolina A & T University, 1975

RESEARCH ASSOCIATE PROFESSOR

I.J. Wilhelm, M.S., Boston University, 1968, B.S., Russell Sage College, 1957

RESEARCH ASSISTANT PROFESSOR

H.L. Cook, M.S., University of North Carolina at Chapel Hill, 1969, A.B., University of North Carolina at Chapel Hill, 1966

RESEARCH INSTRUCTOR

R.G. Plaisted, B.S., University of Pittsburgh, 1946

CLINICAL ASSOCIATE PROFESSOR

D. Lindsey, M.P.H., University of North Carolina at Chapel Hill, 1975, B.S., Kent State University, 1965

B.B. Lubker, Ph.D., University of North Carolina at Chapel Hill, 1982, M.A., University of Kentucky, 1956, M.A., Troy State University, 1953

S.J. Martinkosky, Ph.D., Ohio State University, 1975, M.A., Western Michigan University, 1967, B.S., Ohio University, 1966

J.G. Olley, Ph.D., George Peabody College, 1972, M.A., Wake Forest University, 1968, A.B., College of William and Mary, 1966

W.G. Thomas, Ph.D., University of Florida, 1968, M.A., Washington University, 1961, B.S., Appalachian State University, 1957

CLINICAL ASSISTANT PROFESSOR

S.M. Attermeier, M.A., University of North Carolina at Chapel Hill, 1977, B.S., Marquette University, 1964

C.T. Calvert, M.S., Syracuse University, 1980, B.S., Colorado State University, 1973, A.A., Green Mountain College, 1971 (Resigned May, 1989)

C. Cochrane, M.S., University of North Carolina at Chapel Hill, 1987, B.S., University of Pennsylvania, 1974 (Resigned October, 1989)

C.C. Figuers, M.S., Duke University, 1981, B.A., Wake Forest University, 1978

H.F. Harris, M.S., University of North Carolina at Chapel Hill, 1973, B.A., Duke University, 1972

M.F. Harrison, M.Ed., Boston University, 1973, B.A., Emory University, 1970

C.R. Hooper, Ph.D., Case Western Reserve University 1979, M.A., University North Carolina, Greensboro, 1974, M.A., Wake Forest University 1973

J.F. Krugh, M.S., University of North Carolina at Chapel Hill, 1984, B.S., University of Florida, 1978, B.S., University of Illinois, 1971 (Resigned September, 1988)

J.T. McCallum, Jr., M.Ed., University of Georgia, 1972, B.A., Mercer University, 1967

D.E. Parker, M.S., Massachusetts General Hospital Institute, 1985, B.S., University of North Carolina at Chapel Hill, 1981

M.A. Reilly, Ph.D., University of Texas, 1989, M.S., Boston University 1976, B.S., Northwestern University, 1972

S.M. Renwick, B.S., Johnson C. Smith University, 1957

S.S. Ringwalt, M.S., Vanderbilt University, 1976, B.A., University of North Carolina at Chapel Hill, 1974

D.S. Slaton, B.S., University of Pittsburgh, 1973

S.K. Zwadyk, M.S., Emory University, 1982, B.S., Presbyterian College, 1978, B.S., Presbyterian College, 1976

CLINICAL INSTRUCTOR

E.D. Ballard, M.S., University of North Carolina at Chapel Hill, 1983, B.A., University of North Carolina at Chapel Hill, 1980 (Resigned November, 1989)

P.P. Coleman, M.S., University of North Carolina at Chapel Hill, 1982, B.A., University of North Carolina, Greensboro, 1981 (Resigned July, 1989)

D.W. Crook, University of North Carolina at Chapel Hill, 1979, B.A., University of North Carolina at Chapel Hill, 1978 (Resigned August, 1988)

E. Justus, B.S., University of North Carolina at Chapel Hill, 1980

H.J. Ludington, M.S., University of North Carolina at Chapel Hill, 1981, B.A., Middlebury College, 1957

H.C. Palmore, M.S., University of North Carolina at Chapel Hill, 1988, B.A., Mary Baldwin College, 1979

J.E. Sexton, M.S., East Carolina University, 1979, B.S., 1977

B.H. Thornton, M.Ed., University of North Carolina at Chapel Hill, 1982, B.S., Georgia College, 1956

J.A. White, M.S., University of North Carolina at Chapel Hill, 1984, B.S., University of North Carolina at Chapel Hill, 1969

VISITING CLINICAL INSTRUCTOR

P.J. Henderson, , M.A., University of Tennessee, 1974, B.S., University of Tennessee, 1973

K.D. Jones, , B.A., East Carolina University, 1980, B.S., University of North Carolina at Chapel Hill, 1981

The Division of Cytotechnology

This accredited certificate program is offered jointly by the Department of Medical Allied Health Professions, Department of Pathology and University of North Carolina Hospitals. Completion of the program qualifies the graduate to take the national examination for certification as a cytotechnologist.

The cytotechnologist is a medical laboratory specialist who plays a vital role in cancer diagnosis. A knowledge of cell behavior and cell patterns not only aids this health professional to diagnose various types of cancer and other diseases, but to detect and diagnose cancer in its early stages of development. Quite often early diagnosis of cancer increases chances for cure or long-term survival.

The 12 month curriculum includes: basic cytology microscopy, gross and microscopic anatomy, physiology, pathology and cytopathology of body organs. Other areas of study are specimen collection cytopreparation, laboratory organization and management and an introduction to cytogenetics.

Applicants must have a baccalaureate degree from an accredited university or college, or upon the successful completion of the cytotechnology program, be guaranteed a baccalaureate degree from an affiliated university or college. The minimum science pre-requisites are:

20 semester hours (30 quarter hours) of biological sciences
8 semester hours (12 quarter hours) of chemistry
3 semester hours (4.5 quarter hours) of mathematics

Applications and admission procedures may be obtained from the Division of Cytotechnology, Department of Medical Allied Health Professions, CB 7120, Wing E, University of North Carolina, Chapel Hill, NC 27599-7120 (919-966-2339).

DIVISION DIRECTOR

Sandra M. Renwick, B.S., C.T. (ASCP), Johnson C. Smith University, 1957, Assistant Clinical Professor, Department of Medical Allied Health Professions

MEDICAL DIRECTOR

Richard W. Shermer, M.D., The University of North Carolina at Chapel Hill,1963, Associate Professor, Department of Pathology

The Division of Medical Technology

In order to meet the medical and hospital needs in North Carolina and in order to provide a quality education in medical technology for young men and women of the State, the School of Medicine of The University of North Carolina at Chapel Hill, with the cooperation of the Department of Laboratories of the University of North Carolina Hospitals, offers a program in Medical Technology leading to a baccalaureate degree.

The major in Medical Technology is designed to be completed in four calendar years. The curriculum consists of two years in the General College at the University of North Carolina in Chapel Hill (or its equivalent elsewhere) and two years in the School of Medicine. Upon successful completion, the student is awarded the Bachelor of Science in Medical Technology and is eligible to take a national examination to become a certified Medical Technologist.

Prerequisites and course descriptions are listed in the Undergraduate Bulletin of the Record of The University of North Carolina at Chapel Hill. Further information may be obtained from the Division of Medical Technology, Department of Medical Allied Health Professions, CB 7120, Wing E, University of North Carolina, Chapel Hill, NC 27599-7120 (919-966-3011).

DIRECTOR

R. C. Stevens, M.S., State University of New York at Buffalo, 1971

MEDICAL ADVISOR

W. W. McLendon, M.D., The University of North Carolina at Chapel Hill, 1956

The Division of Occupational Therapy

The Division of Occupational Therapy offers a program leading to the Master of Science degree. Courses are offered with an emphasis on psychiatric and physical rehabilitation across the life span. Students will be prepared for clinical practice, administration, and research in a wide variety of institutional and community health care settings. The program is designed for students with baccalaureate degrees in fields other than occupational therapy.

Prerequisites and course descriptions are listed in the Record of the Graduate School of the University of North Carolina at Chapel Hill. For further information contact the Division of Occupational Therapy, Department of Medical Allied Health Professions, CB 7120, Wing E, University of North Carolina, Chapel Hill, NC 27599-7120 (919-966-2451).

DIVISION DIRECTOR

Catherine Nielson, M.P.H., O.T.R/L.

PROFESSOR

M. M. Mitchell, Ph.D., O.T.R./L., F.A.O.T.A.

ASSISTANT PROFESSORS

R. A. Humphry, Ph.D., O.T.R./L.
M. J. McGuire, M.S., O.T.R./L.
C. Nielson, M.P.H., O.T.R./L.
E. Taylor, Ph.D., O.T.R./L.

CLINICAL ASSISTANT PROFESSOR

J. D. Rourk, B.S., O.T.R./L.

CLINICAL INSTRUCTOR

K. H. Jewell, M.Ed., O.T.R./L.

The Division of Physical Therapy

Physical Therapy is one of the health professions participating in the comprehensive approach to patient service, providing services related to patient assessment, treatment, and education in varied settings including acute care hospital, rehabilitation center, children's' centers, private practice, and others. To meet the increasing demand for physical therapists in North Carolina and the Southeast, two educational programs are offered. The undergraduate level is designed to provide basic preparation for entry into the field, and the graduate program is designed for physical therapists wishing to gain advanced information in specialty areas.

Undergraduate prerequisite information is available in the Undergraduate Bulletin of the Record of The University of North Carolina at Chapel Hill, and course descriptions are available from the Division of Physical Therapy, Department of Medical Allied Health Professions, CB 7120, Wing E, University of North Carolina, Chapel Hill, NC 27599-7120 (919-966-4708).

Graduate prerequisite and course descriptions are available in The Record of the Graduate School of The University of North Carolina at Chapel Hill.

DIRECTOR

D. K. Sekerak, M.S., P.T., University of North Carolina at Chapel Hill, 1982

PROFESSORS

R. U. Mitchell, Ph.D., P.T., Western Reserve University, 1970

ASSOCIATE PROFESSOR

B. R. Howes, M.S., P.T., Eastern Michigan University, 1971

C. M. Nelson, M.A., P.T., Duke University, 1964

C. P. Schuch, M.S., P.T., University of Pennsylvania, 1952

ASSISTANT PROFESSOR

C. A. Giuliani, Ph.D., P.T., University of California at Los Angeles, 1985

M. T. Gross, Ph.D., P.T., University of North Carolina at Chapel Hill, 1983

K. E. Light, Ph.D., P.T., University of Texas, 1988

C. L. Riegger, Sc.D., P.T., Boston University, 1986

J. W. Sparling, Ph.D., P.T., University of North Carolina at Chapel Hill, 1987

P. L. Witt, Ph.D., P.T., Union Institute, 1988

INSTRUCTOR

R. G. Plaisted, B.S., University of Pittsburgh, 1946

RESEARCH ASSOCIATE PROFESSOR

I. J. Wilhelm, M.S., P.T., Boston University, 1968

CLINICAL ASSOCIATE PROFESSOR

D. Lindsey, M.P.H., P.T., Duke University, 1975

CLINICAL ASSISTANT PROFESSOR

C. C. Figuiers, M.S., P.T., Duke University, 1981

D. Parker, M.S., P.T., Massachusetts General Hospital Institute of Health Professions, 1985

M. A. Reilly, Ph.D., P.T., University of Texas, 1989

CLINICAL INSTRUCTOR

J. A. White, M.S., P.T., University of North Carolina at Chapel Hill, 1984

ADJUNCT ASSOCIATE PROFESSOR

R. G. McMurray, Ph.D., Indiana University, 1977

W. E. Prentice, Ph.D., University of Virginia, 1980

J. M. Wilson, M.A.C.T., University of North Carolina at Chapel Hill, 1975

ADJUNCT ASSISTANT PROFESSOR

D. N. Hooker, Ph.D., P.T.

S. McLaurin, M.Ed., North Carolina Central University, 1974

K. J. O'Donnell, Ph.D. University of North Carolina at Chapel Hill, 1983, M.Ed., University of North Carolina at Chapel Hill, 1974

ADJUNCT INSTRUCTOR

A. L. Jamerson, B.S., University of North Carolina at Greensboro, 1959

B. Skinner, M.S., Duke University, 1977

The Division of Radiologic Science

Diagnostic imaging advances such as computed tomography, digital radiography and magnetic resonance imaging have placed radiologic technology among the most rapidly changing health professions in clinical medicine.

Following the freshman and sophomore general college years, the third and fourth years are taken in the University of North Carolina at Chapel Hill School of Medicine, Division of Radiologic Science. Third year courses include: human anatomy, physiology, imaging physics, radiography and clinical education. A 12-week clinical internship is required during the summer following the junior year. Studies during the senior year include: advanced radiography and special studies such as vascular imaging and computed tomography, trends in radiologic technology, research, education, management and clinical education. The senior level curriculum through contract learning allows students to elect a clinical specialty, health physics, education or management advanced study option.

After completion of the curriculum a student is awarded a Bachelor of Science degree in Radiologic Science and is eligible for the national certification examination administered by the American Registry of Radiologic Technologists.

Prerequisites and admission procedures are available in The Undergraduate Bulletin of The Record of the University of North Carolina at Chapel Hill. Course descriptions are available from the Division of Radiologic Science, Department of Medical Allied Health Professions, CB 7130, Wing E, The University of North Carolina, Chapel Hill, NC 27599-7130 (919-966-5146).

CLINICAL ASSISTANT PROFESSOR AND DIRECTOR

J. Justus, B. S., University of North Carolina at Chapel Hill, 1980

ASSISTANT PROFESSOR AND MEDICAL ADVISOR

J. Renner, M.D., University of Virginia, 1980

ASSOCIATE PROFESSOR

J. Keene, M.S., University of Cincinnati, 1971

R. L. Thorpe, Ed.D., North Carolina State University, 1981

INSTRUCTOR

D. Wright, M.S., North Carolina State University, 1988

LECTURER

P. Gratale, B.S., University of North Carolina at Chapel Hill, 1983

The Nuclear Medicine Technology Program

A 12-month program in Nuclear Medicine Technology is conducted by the faculty and staff of the Imaging Division, Radiology Department, University of North Carolina Hospitals and the School of Medicine of The University of North Carolina. The program is fully accredited by the American Medical Association's Committee on Allied Health Education and Accreditation. Graduates of the program are awarded the Certificate in Nuclear Medicine Technology by The University of North Carolina and University of North Carolina Hospitals. After completing the program, graduates are eligible for national certification by the American Registry of Radiologic Technologists, the American Society of Clinical Pathologists, and the Nuclear Medicine Technology Certification Board, Inc.

Classes begin in August of each year. Applicants eligible for consideration must be certified as a radiologic technologist (ARRT) or a graduate of an accredited radiologic science program, and eligible for certification; a medical technologist (ASCP); or be a college graduate with a Bachelor of Science degree with a major in one of the biological or health sciences.

Application forms and other materials may be obtained from the Division of Radiologic Science, Department of Medical Allied Health Professions, CB 7130, Wing E, The University of North Carolina, Chapel Hill, NC 27599-7130 (919-966-2343).

PROGRAM DIRECTOR

M. W. Parrish, C.M.T., North Carolina Memorial Hospital, 1968

MEDICAL DIRECTOR

W. H. McCartney, M.D., Northwestern University at Chicago, 1969

FACULTY

R. E. Johnston, Ph.D., Vanderbilt University, 1968

R. J. Kowalsky, Pharm.D., University of Kentucky, 1972

J. R. Perry, M.D., University of Tennessee, 1967

H. McMurray, M.S., University of North Carolina at Chapel Hill, 1984

J. Raleigh, Ph.D., Massachusetts Institute of Technology, 1967

B. Wilson, M.S., University of Oklahoma, 1970

The Radiation Therapy Technology Program

The program in Radiation Therapy Technology is conducted by the faculty and staff of the Division of Radiation Therapy, The University of North Carolina School of Medicine and University of North Carolina Hospitals. The program is approved by the American Medical Association's Committee on Allied Health Education and Accreditation. Graduates are eligible for the certification examination in Radiation Therapy as administered by The American Registry of Radiologic Technologists.

This one-year program, beginning in August, consists of both extensive didactic and clinical education. The clinical faculty is equipped with a Theratron-80 cobalt unit, Siemans Mevtron 20 MV linear Accelerator with electron capabilities, a Siemans 615 MD Linear Accelerator with electron capabilities, Toshiba Simulator and a CT Simulator. There is an expanding computer facility, an adequate supply of brachytherapy sources, a Buchler afterloading system and a clinitherm interstitial hyperthermia unit.

Applications will be considered from individuals who are certified as Radiographers by the American Registry of Radiologic Technologists. Applications may be obtained from the Department of Radiation Oncology, CB 7512, University of North Carolina Hospitals, Chapel Hill, NC 27599-7512, and must be completed by March 1 of the year of desired entrance into the program.

PROGRAM DIRECTOR

A. A. Lindsey, B.S., R.T. (R) (T), Elon College, 1984

MEDICAL ADVISOR

M. Varia, M.B., Ch.B., University of Liverpool, England, 1967

DIDACTIC FACULTY

E. Chaney, Ph.D., University of Tennessee, 1969

H. McMurray, M.S., University of North Carolina at Chapel Hill, 1984

J. Raleigh, Ph.D., Massachusetts Institute of Technology, 1967

B. Wilson, M.S., University of Oklahoma, 1970

The Diagnostic Medical Sonography Program

The School of Medicine and the University of North Carolina Hospitals through the Division of Imaging, Department of Radiology, sponsors a twelve-month program in Diagnostic Medical Sonography. Graduates are awarded a certificate in Diagnostic Medical Sonography by the School of Medicine and the University of North Carolina Hospitals, and are eligible for national certification by the American Registry of Diagnostic Medical Sonographers.

The general curriculum includes physics, instrumentation, anatomy, physiology, and didactic and clinical instruction in abdominal, obstetrical, pelvic, neck, extremities and other applications.

Applicants eligible for admission consideration must qualify in one of the two following categories:

1. Registered radiologic technologist (ARRT) or a graduate eligible for certification by the American Registry of Radiologic Technologists.
2. Registered nuclear medicine technologist (ARRT or NMTCB) or eligible for certification by the American Registry of Radiologic Technologists or the nuclear medicine technology certification board.

Application forms are available on request from the Division of Radiologic Science, Department of Medical Allied Health Professions, CB 7130, Wing E, The University of North Carolina, Chapel Hill, NC 27599-7130 (919-966-5146).

PROGRAM DIRECTOR

E. Rowley, R.T.R., R.O.M.S., R.E. Thompson General Hospital, 1984

MEDICAL DIRECTOR

C. Mittelstaedt, M.D., University of Arkansas, 1971

DIDACTIC STAFF

B. Keefe, M.D., Columbia University, 1981

R. E. Johnston, Ph.D., Vanderbilt University, 1968

The Division of Rehabilitation Counseling

This is a four-semester master's degree professional program in Rehabilitation Counseling. The program is interdisciplinary in nature and is developed to meet each student's individual needs, with theory and practice integrated throughout the four-semester program. Background work in the behavioral sciences, the social sciences, and allied health areas is recommended.

The primary objective of this program is to educate rehabilitation counselors to become practicing professionals for work with persons having disabilities in medical and psychiatric rehabilitation facilities, State-Federal rehabilitation programs, private industry, and other related areas.

Prerequisites and course descriptions are available in The Graduate School, Record of The University of North Carolina at Chapel Hill. For further information contact the Division of Rehabilitation Counseling, Department of Medical Allied Health Professions, CB 7120, Wing E, University of North Carolina, Chapel Hill, NC 27599-7120 (919-966-3351).

PROFESSOR & DIRECTOR

P. Leung, Ph.D., Arizona State University, 1970

PROFESSOR

R. Sakata, Ph.D., Kent State University, 1970

ASSOCIATE PROFESSOR

C. L. Wilhelm, Ph.D., Indiana State University, 1976

ASSISTANT PROFESSOR

C.M.C. Kampfe, Ph.D., University of Arizona, 1984

S.S. Ostby, Ph.D., University of Wisconsin-Madison, 1982

CLINICAL ASSOCIATE PROFESSOR

J. G. Olley, Ph.D., George Peabody College of Teachers, Nashville, TN, 1972

The Division of Speech and Hearing Sciences

The Division of Speech and Hearing Sciences in the Department of Medical Allied Health Professions, School of Medicine, provides academic and professional training for speech and language pathologists and audiologists at the master's degree level. The study of speech and hearing concerns knowledge and practices pertaining to both normal and abnormal speech, hearing and language. The Speech and Hearing Curriculum provides an environment where learning can be based on both clinical and experimental laboratory experiences. Two major tracks of study are possible within the master's curriculum: Audiology and Speech, and Language Pathology. The program is interdisciplinary in that personnel and clinical and research activities of other University departments and institutions, as well as the Division of Speech and Hearing Sciences, are involved in the educational program.

Prerequisites and course descriptions are available in The Graduate School, The University of North Carolina at Chapel Hill. More detailed prerequisite information is available from the Division of Speech and Hearing Sciences, Department of Medical Allied Health Professions, School of Medicine, CB 7130, Wing E, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-7130 (919-966-1006).

ASSOCIATE PROFESSOR AND DIRECTOR

T. L. Layton, Ph.D., University of Nebraska-Lincoln, 1976

PROFESSOR

R. W. Peters, Ph.D., Ohio State University, 1953

D. E. Yoder, Ph.D., University of Kansas, 1965

ASSOCIATE PROFESSOR

P. B. Porter, Ph.D., University of North Carolina at Chapel Hill, 1980

ASSISTANT PROFESSOR

E. R. Crais, Ph.D., University of Wisconsin, 1986

J. Roush, Ph.D., University of Michigan, 1981

CLINICAL PROFESSOR

F. C. Knobeloch, Ph.D., University of Florida, 1959

CLINICAL ASSOCIATE PROFESSOR

R. Dalston, Ph.D., Northwestern University, 1972

J. W. Hall, Ph.D., University of North Carolina at Greensboro, 1976

S. J. Martinkosky, Ph.D., Ohio State University, 1974

CLINICAL ASSISTANT PROFESSOR

T. H. Cameron, Ph.D., University of North Carolina at Chapel Hill, 1985

M. F. Harrison, Ph.D., University of North Carolina at Chapel Hill, 1988

C. R. Hooper, Ph.D., Case Western Reserve University, 1979

B. B. Lubker, Ph.D., University of North Carolina at Chapel Hill, 1982

J. T. McCallum, M.Ed., University of Georgia, 1973

J. E. Roberts, Ph.D., Indiana University, 1981

CLINICAL INSTRUCTOR

H. F. Harris, M.S., University of North Carolina at Chapel Hill, 1973

P. J. Henderson, M.A., University of Tennessee, 1974

H. J. Ludington, M.S., University of North Carolina at Chapel Hill, 1981

S. Ringwalt, M.S., Vanderbilt University, 1976

J. E. Sexton, M.S., East Carolina University, 1979

ADJUNCT ASSOCIATE PROFESSOR

R. G. Paul, Ph.D., University of Oklahoma, 1969

ADJUNCT INSTRUCTOR

C. R. Bell, M.A., Ohio University, 1979

V. V. Clifford, M.S., University of North Carolina at Chapel Hill, 1973

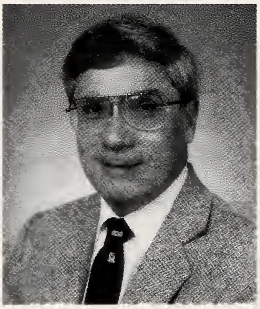
A. L. Gill, M.A., North East Missouri State University, 1981

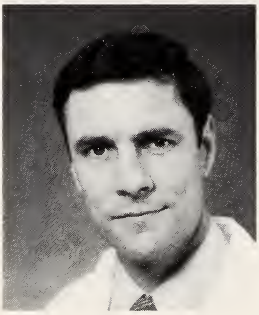
M. M. Haythorn, Ph.D., University of California at Davis, 1977

J. D. Royster, Ph.D., North Carolina State University, 1981

B. A. Weber, Ph.D., University of Illinois, 1966

The Department of Medicine





The Department of Medicine has primary responsibilities for teaching medical students, residents and post-doctoral fellows in the clinical area of internal medicine. These teaching activities take place in the outpatient clinics and on the inpatient services of the University of North Carolina Hospitals, and at affiliated hospitals in Charlotte, Wilmington, Raleigh, Greensboro and Asheville. In addition to basic education in primary care internal medicine, the department offers electives or post-doctoral training programs in a number of internal medicine subspecialties including cardiology, clinical epidemiology, digestive diseases and nutrition, endocrinology and metabolism, geriatric medicine, hematology, infectious diseases, medical genetics, nephrology, oncology, pulmonary diseases and rheumatology. Care of patients with a wide variety of problems within the field of internal medicine is an essential part of the department's training activities. Expert medical care by members of the department is also an important service to the people of North Carolina. Original clinical or biomedical research is conducted by most faculty members, with opportunities for participation by students or post-doctoral trainees at all levels. The range of research topics is extensive, from clinical outcome analysis to basic molecular and cell biology.

DEPARTMENT CHAIR

P. Frederick Sparling, (J. Herbert Bate Professor of Medicine and Microbiology and Immunology), M.D., Harvard University, 1962 (appointed 6/15/89)

David A. Ontjes (Eunice Bernhard Distinguished Professor of Medicine), M.A., Oxford University, 1961; M.D., Harvard University, 1964 (resigned as Chair 6/14/89)

PROFESSOR

T.B. Barnett, (Bonner Professor of Pulmonary and Allied Diseases of Medicine) M.D., Rochester, 1949, A.B., Tennessee, 1944, (Retired September, 1989)

W.B. Blythe, (Marion Covington Distinguished Professor of Medicine) M.D., Washington University 1953, A.B., University of North Carolina at Chapel Hill, 1948

S. Bondurant, (Dean, School of Medicine), M.D., Duke University, 1953.

E.M. Bozymski, M.D., Marquette University, 1960, B.S., John Carroll University, 1956

R.A. Briggaman, M.D., New York University, 1960, B.S., Trinity College, 1956

P.A. Bromberg, (Director, Center for Environmental Medicine) M.D., Harvard University, 1953, B.S., Queens College, 1949

I.J. Bryan, M.D., University of Pennsylvania, 1957, M.P.H., University of North Carolina at Chapel Hill, 1966, B.S., Davidson College, 1953

Y. Cheng, Ph.D., Brown University, 1972, B.Sc., Tunghai University, Republic of China, 1966 (Resigned June, 1989)

D.R. Clemmons, M.D., University of North Carolina at Chapel Hill, 1974, B.S., Davidson College, 1969

R.E. Colindres, M.D., University of El Salvador, 1966

H.E. Dascomb, M.D., University of Rochester, 1943, A.B., Colgate University, Hamilton, 1938

G.H. DeFriese, Ph.D., University of Kentucky, 1967, M.A., University of Kentucky, 1966, B.S., Middle Tennessee State University, 1963

D.J. Delany, M.D., Cambridge University, 1963, M.A., Cambridge University, 1961 (Resigned November, 1989)

D.L. Dolan, M.D., Vanderbilt University, 1955, B.A., Vanderbilt University, 1952

J.F. Donohue, M.D., College of Medicine and Dentistry, 1969, A.B., St. Peters College, 1965

I.H. Earp, M.D., University of North Carolina at Chapel Hill, 1970, M.S., University of North Carolina at Chapel Hill, 1972, A.B., Johns Hopkins University, 1966

F.L. Eldridge, M.D., Stanford University, 1948, A.B., Stanford University, 1945

D.L. Evans, M.D., Temple University, 1976, M.S., Bucknell University, 1972, B.S., Elizabethtown College, 1970

A.L. Finn, M.D., Boston University, 1958, A.B., Harvard University, 1954

W.F. Finn, M.D., State University of New York, 1966, B.S., Le Moyne College, 1962

J.J. Fischer, (Sarah Graham Kenan Professor of Medicine) M.D., Johns Hopkins University, 1948, A.B., Vassar College, 1944

R.H. Fletcher, (Co-Director, The Robert Wood Johnson Clinical Scholars Program) M.D., Harvard University, 1966, M.S., Johns Hopkins University, 1973, M.S., Wesleyan University, 1962

S.W. Fletcher, M.D., Harvard University, 1966, M.S., Johns Hopkins University, 1973, M.S., Swarthmore College, 1962

C.C. Fordham III, M.D., Harvard University, 1951

J.R. Foster, M.D., Cornell University, 1969, B.A., Amherst College, 1965

M. Friedman, M.D., University of Miami, 1969

D.A. Gabriel, (Assistant Dean and Associate Chief of Staff for Inpatient Care, University of North Carolina Hospitals) M.D., University of North Carolina at Chapel Hill, 1972, Ph.D., University of North Carolina at Chapel Hill, 1979, B.S., University of North Carolina at Chapel Hill, 1965

W.R. Gammon, M.D., University of North Carolina at Chapel Hill, 1971, B.S., North Carolina State University, 1967

L.S. Gettes, (Henry A. Foscue Distinguished Professor of Medicine) M.D., University of Pennsylvania, 1958, B.A., Harvard University, 1954

H.J. Gitelman, M.D., University of Rochester, 1958, A.B., Princeton University, 1954

C.W. Gottschalk, (Kenan Professor of Medicine) M.D., University of Virginia, 1945, Sc. D., Roanoke College, 1966, B.S., Roanoke College, 1942

T.K. Gray, M.D., University of Maryland, 1965, B.S., Loyola College, 1961

T.R. Griggs, M.D., University of North Carolina at Chapel Hill, 1969, B.A., University of North Carolina at Chapel Hill, 1965

J.W. Grisham, M.D., Vanderbilt University, 1957, B.A., Vanderbilt University, 1953

N.M. Hadler, M.D., Harvard University, 1968, A.B., Yale University, 1964

C.D. Hall, M.D., Aberdeen University, 1966

J.N. Hayward, (H. Houston Merritt Distinguished Professor of Neurology) M.D., Tufts University, 1954, B.S., Tufts University, 1950

W.D. Heizer, M.D., Johns Hopkins University, 1963, A.B., King College, 1958

J.C. Herion, M.D., Harvard University, 1953, B.S., Davidson College, 1949

W.B. Herring, M.D., Bowman Gray School of Medicine, 1953, B.S., Wake Forest College, 1949

A.J. Hoole, M.D., Medical University of South Carolina, 1964, B.A., University of the South, 1960

E. Huang, Ph.D., University of North Carolina at Chapel Hill, 1971, M.S., National Taiwan University, 1964, B.S., National Taiwan University, 1962

J.S. Kizer, M.D., Duke University, 1970, A.B., Princeton University, 1966

W.E. Lassiter, M.D., Harvard University, 1954, A.B., Harvard University, 1950

S.M. Lemon, M.D., University of Rochester, 1972, A.B., Princeton University, 1968

H.R. Lesesne, M.D., Vanderbilt University, 1967, B.A., Vanderbilt University, 1963

J.C. Lyle, M.D., Columbia University, 1957, B.A., Princeton University, 1953

W.D. Mattern, (Associate Dean for Academic Affairs) M.D., Columbia University, 1965, B.A., Hamilton College, 1961

E.S. Mayer, (Associate Dean and Director, North Carolina Area Health Education Centers) M.D., Columbia University 1964, M.P.H., Yale University, 1971, B.S., Tufts University, 1960

C.T. Nuzum, M.D., Harvard University, 1964, M.A., Cambridge University, 1965, M.A., Cambridge University, 1961, A.B., Harvard University, 1959

D.A. Ontjes, (Eunice Bernard Distinguished Professor of Medicine) M.D., Harvard University, 1964, M.A., Oxford University, 1961, M.A., University of Kansas, 1959

R.C. Orlando, M.D., Georgetown University, 1968, B.S., Queens College, 1964

E.P. Orringer, (Dr. Vern Caviness Professorship of Investigative Medicine) (Director, Clinical Research Unit) M.D., University of Pittsburgh, 1969, A.B., University of Michigan, 1965

H. Ozer, M.D., Yale University, 1975, Ph.D., Yale University, 1975, B.S., Yale University, 1969

J.S. Pagano, (The Lineberger Professorship in Cancer Research) (Director, Lineberger Cancer Research Center) M.D., Yale University, 1957, A.B., University of Rochester, 1953

J.G. Palmer, M.D., Emory University, 1944, B.S., Emory University, 1942

J.C. Parker, M.D., Yale University, 1961

J.C. Pickard, M.D., University of North Carolina at Chapel Hill, 1962, B.A., University of North Carolina at Chapel Hill, 1958

D.W. Powell, (Director, Program in Digestive Diseases and Nutrition) M.D., Medical College of Alabama, 1963, B.S., Auburn University, 1960

H.R. Roberts, (Sarah Graham Kenan Professor of Medicine and Pathology) (Director, Center for Thrombosis and Hemostasis) M.D., University of North Carolina at Chapel Hill, 1955, B.S., University of North Carolina at Chapel Hill, 1952

D.W. Ross, M.D., University California, San Francisco, 1974, Ph.D., University of California, Berkeley, 1972, B.A., Cornell University, 1968

G.D. Ross, M.D., University of Miami, 1971, B.S., University of Florida, 1967

J.T. Sessions, M.D., Emory University, 1945, B.S., Emory University, 1943

D.S. Sheps, M.D., University of North Carolina at Chapel Hill, 1969, B.A., University of North Carolina at Chapel Hill, 1965

J.J. Sorrow, M.D., University of Pennsylvania, 1946, B.S., University of North Carolina at Chapel Hill, 1943 (Retired December, 1988)

P.F. Sparling (J. Herbert Bate Professorship of Medicine), M.D., Harvard University, 1962, A.B., Princeton University, 1958

M.R. Swift, M.D., New York University, 1962, M.A., University of California, Berkeley, 1957, M.A., Swarthmore College, 1955

P.C. Ungaro, M.D., University of Miami, 1968

R.D. Utiger, M.D., Washington University, 1957, A.B., Williams College, 1953 (Resigned March, 1989)

R.I. Walker, M.D., Harvard University, 1954, B.S., University of North Carolina at Chapel Hill, 1950

J.E. Werk, M.D., University of Cincinnati, 1946, A.B., Williams College, 1944

G.C. White, II, M.D., University of North Carolina at Chapel Hill, 1971, M.S., University of North Carolina at Chapel Hill, 1971, A.B., University of North Carolina at Chapel Hill, 1966

J.B. Winfield, (Herman and Louise Smith Distinguished Professor of Medicine in Arthritis) (Director, Multipurpose Arthritis Center) M.D., Cornell University, 1968, B.A., Williams College, 1964

W.B. Wood, (Associate Dean) M.D., University of North Carolina at Chapel Hill, 1956, B.S., University of North Carolina at Chapel Hill, 1953

D.T. Young, M.D., Harvard University, 1950, B.S., Guilford College, 1946

W.J. Yount, M.D., University of Wisconsin, 1960, B.S., University of Wisconsin, 1957

ASSOCIATE PROFESSOR

B.A. Boehlecke, M.D., State University of New York, Buffalo, 1970, M.S., University of North Carolina at Chapel Hill, 1981, M.S., Cornell University, 1966

J.R. Boucher, M.D., Columbia University, 1970, B.A., Yale University, 1966

M.S. Cohen, M.D., Rush Medical College, 1974, B.S., University of Illinois, Urbana, 1971

P.L. Cohen, M.D., Yale University, 1972, B.S., City College of New York, 1968

L. Cubeddu, M.D., Central University, Venezuela, 1964, Ph.D., University of Colorado, 1974, M.S., Central University, Venezuela, 1968 (Resigned June, 1989)

G.J. Dehmer, M.D., University of Wisconsin, 1975, B.S., Carroll College, 1971

D.A. Drossman, M.D., Albert Einstein College, 1970, B.A., Hofstra University, 1966

A.L. Ehle, M.D., University of Washington, 1967, M.S., University of Washington, 1967, B.S., Washington State University, 1962

R.A. Eisenberg, M.D., Stanford University, 1971, B.A., Haverford College, 1966

R.J. Falk, M.D., University of North Carolina at Chapel Hill, 1977, B.S., Dartmouth College, 1973

J.J. Gonzalez, M.D., University of Chile, 1971

R.S. Greenwood, M.D., University Texas, Galveston, 1968, B.A., University of Texas, Austin, 1965

M.A. Greganti, M.D., University of Mississippi, 1972, B.S., Millsaps College, 1968

D.H. Gremillion, M.D., Louisiana State University, 1972, B.S., Louisiana State University, 1968

J.T. Gwynne, M.D., Duke University, 1970, B.S.E., Princeton University, 1965

J.E. Hammond, Ph.D., University of Florida, 1974, B.S., Florida State University, 1968

J.J. Howard, M.D., University of Vermont, 1974, B.A., University of Vermont, 1970

E.W. Jensen, M.D., Case Western Reserve University, 1969, B.A., Pomona College, 1963

M.R. Knowles, M.D., University of North Carolina at Chapel Hill, 1971, A.B., University of North Carolina at Chapel Hill, 1967

T.W. Lane, M.D., Cornell University, 1971, B.A., Yale University, 1967

J.D. Mann, M.D., Cornell University, 1969, B.A., Amherst College, 1965

J.A. Messenheimer, M.D., John Hopkins University, 1970, B.S., Mount Union College, 1966

R.H. Raasch,

C.S. Rogers, M.D., University of North Carolina at Chapel Hill, 1973, A.B., Dartmouth College, 1969

R.S. Sandler, M.D., Yale University, 1975, M.P.H., University of North Carolina at Chapel Hill, 1982, B.S., Union College, 1971

R.B. Sartor, M.D., Baylor College of Medicine, 1974, B.S., Washington and Lee University, 1971

J.R. Simpson, M.D., Georgetown University, 1973, B.S., University of Notre Dame, 1969

M.E. Williams, (Director, Program on Aging) M.D., University of North Carolina at Chapel Hill, 1976, B.A., University of North Carolina at Chapel Hill, 1972

P.W. Willis, M.D., University of Michigan, 1975, B.A., University of Pennsylvania, 1971

ASSISTANT PROFESSOR

J.K. Adams, M.D., University of North Carolina at Chapel Hill School of Medicine, 1976, B.S., Duke University, 1972

L.R. Berkowitz, M.D., Ohio State University, 1975, B.S., University of Cincinnati, 1973

S.A. Bernard, M.D., University of North Carolina at Chapel Hill, 1978, B.A., University of Pennsylvania, 1968

T.S. Carey, M.D., University of Vermont, 1976, M.P.H., University of North Carolina at Chapel Hill, 1985, B.A., Colby College, 1972

W.E. Cascio, M.D., University of Maryland, 1980, B.A., Johns Hopkins University, 1977

F.C. Church, Ph.D., North Carolina State University, 1982, M.S., St. Louis University, 1978, B.S., St. Louis University, 1975

M. Danis, M.D., University of Chicago, 1975, B.A., University of Chicago, 1971

A.T. Evans, M.D., University of Texas, Galveston, 1982, B.A., Stanford University, 1975

K.A. High, M.D., University of North Carolina at Chapel Hill, 1978, A.B., Harvard University, 1972

A.L. Hinderliter, M.D., Washington University, 1981, B.S., University of Illinois, 1977

I. Hunt, Ph.D., University of Pittsburgh, 1983, B.S., University of Maryland College, 1975

A. Jain, M.D., State University of New York, Buffalo, 1980, B.S., New York University, 1976

L.G. Johnson, M.D., Medical College of Virginia, 1982, B.S., Duke University, 1978

T.V. Jones, M.D., University of Rochester, 1983, B.S., State University of New, 1979

S.C. Kenney, M.D., Yale University, 1979, B.A., Yale University, 1975

E.T. Liu, M.D., Stanford University, 1978, B.S., Stanford University, 1973

R.A. McNutt, M.D., Michigan State University, 1975, B.A., 1971

T.C. Nichols, M.D., Medical College of Virginia, 1978, B.S., Stanford University, 1974

M.E. O'Brien, M.D., University of Massachusetts, 1980, B.A., Manhattanville College, 1975

C.J. Sanchez, M.D., University of Colorado, 1975, B.S., University of Southern Colorado, 1971

C.B. Seelig, M.D., University of Rochester, 1975, M.S., University of Rochester, 1975, A.B., New York University, 1971

D.A. Tate, M.D., University of North Carolina at Chapel Hill, 1982, B.A., University of North Carolina at Chapel Hill, 1977

S.J. Trued, M.D., George Washington University, 1975, M.P.H., Johns Hopkins University, 1980, B.A., Northwestern University, 1970

C.M. Van der Horst, M.D., Harvard University, 1979, A.B., Duke University, 1974

D.J. Weber, M.D., University of California, San Diego, 1977, M.P.H., Harvard University, 1985, B.A., Wesleyan University, 1973

A.K. Woelfel, M.D., University of Texas, Dallas, 1977, B.A., Rice University, 1973

J. Yankaskas, M.D., University of Connecticut, 1978, M.S., New York University, 1972, B.S., Massachusetts Institute of Technology, 1969

RESEARCH ASSOCIATE PROFESSOR

C.W. Davis, Ph.D., University of North Carolina at Chapel Hill, 1978, M.A., San Francisco State University, 1973, M.A., San Francisco State University, 1969

L. Ekelund, Ph.D., Karolinska Hospital, 1967, M.D., Karoinska Hospital, 1958

M.J. Hazucha, M.D., Comenius University, Czechoslovakia, 1962, Ph.D., McGill University, 1973

W.A. Rutala, Ph.D., University of North Carolina at Chapel Hill, 1979, M.P.H., University of North Carolina at Chapel Hill, 1977, M.S., University of Tennessee, 1972, B.S., the State University of Rutgers, 1970

I.M. Stutts, Ph.D., University of North Carolina at Chapel Hill, 1978, M.S., Georgia Institute of Technology, 1974, B.S., Wake Forest University, 1971

RESEARCH ASSISTANT PROFESSOR

W.D. Bennett, Ph.D., Johns Hopkins University, 1983, B.S., Air Force Academy, 1974

J.J. Buchanan, M.D., University of Kentucky, 1975, M.S., University of Kentucky, 1969, B.S., University of Kentucky, 1967

T.H. Fischer, Ph.D., Florida State University, 1981, B.S., Florida State University, 1977

R.P. Harris, M.D., Johns Hopkins University, 1970, B.A., Johns Hopkins University, 1967

D.C. Henke, M.D., University of North Carolina at Chapel Hill, 1977, M.P.H., University of North Carolina at Chapel Hill, 1973, B.S., University of Maryland, 1969

T.A. Johnson, Ph.D., University of North Carolina at Chapel Hill, 1983, M.S., Chicago State University, 1976, M.S., Illinois State University, 1972

R.H. McCusker, Ph.D., University of Georgia, 1985, M.S., Pennsylvania State University, 1981, M.S., Pennsylvania State University, 1976

L.M. Meadows, M.D., University of North Carolina at Chapel Hill, 1982

I.D. Monroe, Ph.D., University of North Carolina at Chapel Hill, 1983, B.S., University of Georgia, 1977

C.M. Noyes (Resigned July, 1988)

A.M. Paradiso, Ph.D., University of California, 1985, M.S., Washington State University, 1981, B.S., Washington State University, 1979

W. Reed, Ph.D., University of California, San Francisco, 1984, B.S., University of San Francisco, 1973

M.R. Van Scott, Ph.D., West Virginia University, 1984, B.S., Cornell University, 1981

RESEARCH INSTRUCTOR

W.L. Combest, Ph.D., University of Arizona, 1979, M.S., University of Arizona, 1976, B.S., Southern Methodist University, 1973 (Resigned September, 1989)

CLINICAL PROFESSOR

J.R. Harper, M.D., University of North Carolina at Chapel Hill, 1960, A.B., University of North Carolina at Chapel Hill, 1956

M. Lipkin, M.D., Cornell University, 1930, B.S., City College of New York, 1926 (Deceased April, 1989)

R.G. McAllister, M.D., Medical College of Virginia, 1967, B.S., Hampden-Sydney College, 1963

J.J. O'Rourke, M.D., University of Kentucky, 1966, B.S., 1961

T.H. Smelzer, M.D., Columbia University, 1962, A.B., Hamilton College, 1958

J.C. Wheeler, M.D., University of Wisconsin, Madison, 1941, B.A., San Mateo Junior College, 1938

CLINICAL ASSOCIATE PROFESSOR

R.G. Berger, M.D., University of North Carolina at Chapel Hill, 1976, B.S., Yale University, 1972

D.W. Brown, M.D., University of Rochester, 1967, B.A., Carleton College, 1963

S.S. Gustke, M.D., West Virginia University, 1964 (Resigned October, 1988)

M.L. Levin, M.D., University of Pennsylvania, 1975, B.A., Bryn Mawr College, 1970

S.E. Levinson, M.D., Cornell University, 1974, A.B., Cornell University, 1970

N.J. Robinson, M.D., Duke University, 1963, A.B., West Virginia University, 1959

S.V. Sauter, M.D., University of North Carolina at Chapel Hill, 1974, B.A., Wellesley College, 1970

CLINICAL ASSISTANT PROFESSOR

R.S. Grossman, M.D., New York Medical College, 1980, B.A., Hamilton College, 1976

E. Hart-Brothers, M.D., Tufts University, 1976, M.S., Harvard University, 1979, M.S., Brown University, 1972

B.J. Hoffman, M.D., Emory University, 1976, B.S., Duke University, 1972

K.A. Huffman, M.D., West Virginia University, 1977, B.S., Virginia Polytechnic Institute, 1973

J.M. Jordan, M.D., Johns Hopkins University, 1981, A.B., Cornell University 1977

P. Keegan, M.D., Loyola University, 1979, B.S., University of Illinois, 1976

E.S. McConnell, M.S., Duke University, 1978, B.S.N., Duke University, 1976

L.S. Sadowski, M.D., Wayne State University, 1982, M.P.H., University of Michigan, 1981, B.S., Michigan State University, 1978

M.L. Williams, M.D., George Washington University, 1982, B.A., Yale University, 1977

CLINICAL INSTRUCTOR

A.R. Flash, M.S., University of North Carolina at Chapel Hill, 1985, B.S., University of North Carolina at Chapel Hill, 1980, B.A., Oberlin College, 1964

K.K. Hoffman, M.S., University of Virginia, 1987, B.S., Indiana University, 1979

R.S. Lotwin, California College of Podiatric Medicine, 1969, B.S., California College of Podiatric Medicine, 1966

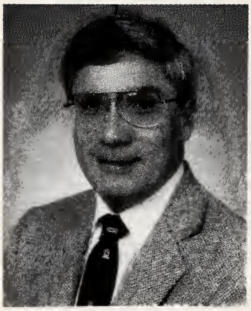
S.W. Perry, B.S., University of North Carolina at Chapel Hill, 1983

VISITING ASSISTANT PROFESSOR

J.L. Madison, Ph.D., Duke University, 1976, M.A., University of Illinois, 1971, M.A., University of Illinois, 1969

VISITING RESEARCH ASSOCIATE PROFESSOR

D.D. Mickey, Ph.D., Louisiana State University, 1969, B.S., Louisiana State University, 1962



The Department of Microbiology and Immunology

Faculty of the Department of Microbiology and Immunology conduct a wide range of research on procaryotic and eucaryotic cells, including bacterial physiology and genetics, RNA and DNA viruses, humoral and cellular immunology, and gene structure and function in higher eucaryotes. Emphasis is on both applied problems (e.g., microbial pathogenesis, mechanisms of inflammation) and basic problems in the molecular biology of microorganisms and eucaryotic cells. Many faculty hold joint appointments in other departments, centers or curricula, and there are many interactive research programs. The department is very well equipped for modern research. Facilities include special centers for microprotein sequencing and fluorescence activated flow cytometry; many laboratories are actively engaged in DNA sequencing, recombinant DNA, monoclonal antibody production, and a host of related methodologies. Teaching programs include courses and supervised research training for over 60 Ph.D. or M.D.-Ph.D. candidate students, and numerous courses in microbiology and immunology for students in the Schools of Medicine, Dentistry, Pharmacy, and Nursing. Microbiology and Immunology

ACTING DEPARTMENT CHAIR

Harry Gooder, Ph.D., University of Leeds, 1952 (appointed 6/15/89)

DEPARTMENT CHAIR

P. Frederick Sparling, (J. Herbert Bate Professor of Medicine and Microbiology and Immunology), M.D., Harvard University, 1962 (resigned as Chair 6/15/89)

PROFESSOR

P.J. Bassford, Jr., Ph.D., University of Virginia, 1977, B.S., Virginia Polytechnic Institute, 1970

K.P. Bott, (Director, Curriculum in Genetics) Ph.D., Syracuse University, 1963, M.S., Syracuse University, 1960, B.S., St. Lawrence University, 1958

J.W. Clyde, M.D., Vanderbilt University, 1954, B.A., Vanderbilt University, 1951

M.H. Edgell, (Kenan Professor of Microbiology) Ph.D., Pennsylvania State University, 1965, M.S., Pennsylvania State University, 1964, B.S., 1961

J.J. Fischer, M.D., Johns Hopkins University, 1948, A.B., Vassar College, 1944

J.D. Folds, Ph.D., Medical College of Georgia, 1967, B.S., University of Georgia, 1962

J.A. Frelinger, (Sarah Graham Kenan Professor of Microbiology) Ph.D., California Institute of Technology, 1973, B.A., University of California, San Diego, 1969

H. Gooder, Ph.D., Leeds University, 1952, B.Sc., Leeds University, 1949

J. Griffith, Ph.D., California Institute of Technology, 1969, B.A., Occidental College, 1964

N.M. Hadler, M.D., Harvard University, 1968, A.B., Yale University, 1964

J.S. Haskill, Ph.D., University of Toronto, 1966, M.A., University of Toronto, 1964, B.S., University of Toronto, 1962

G. Haughton, Ph.D., University of Southampton, 1958, B.S., University of Southampton, 1955

E. Huang, Ph.D., University of North Carolina at Chapel Hill, 1971, M.S., National Taiwan University, 1964, B.S., National Taiwan University, 1962

C.A. Hutchinson, (Kenan Professor of Microbiology) Ph.D., California Institute of Technology, 1968, B.S., Yale University, 1960

R.E. Johnston, Ph.D., University of Texas, 1973, B.A., Rice University, 1968

D.G. Klapper, Ph.D., University of Florida, 1972, M.S., University of Florida, 1970, B.S., Tulane University, 1965

S.M. Lemon, M.D., University of Rochester, 1972, A.B., Princeton University, 1968

G.P. Manire, (Kenan Professor of Microbiology) Ph.D., University of California, 1949, M.S., North Texas State College, 1941 (Retired June, 1989)

J.S. Pagano, (The Lineberger Professorship in Cancer Research and Medicine) (Director, Lineberger Cancer Research Center) M.D., Yale University, 1957, A.B., University of Rochester, 1953

G.D. Ross, M.D., University of Miami, 1971, B.S., University of Florida, 1967

J.H. Schwab, (Cary C. Boshamer Professor of Microbiology) Ph.D., University of Minnesota, 1953, M.S., University of Minnesota, 1950, M.S., University of Minnesota, 1949

P.F. Sparling, (J. Herbert Bate Professorship of Medicine) M.D., Harvard University, 1962, A.B., Princeton University, 1958

P.B. Wyrick, Ph.D., University of North Carolina at Chapel Hill, 1971, M.S., University of North Carolina at Chapel Hill, 1967, B.S., University of North Carolina at Chapel Hill, 1963

ASSOCIATE PROFESSOR

S.L. Bachenheimer, Ph.D., University of Chicago, 1972, B.S., University of Chicago, 1967

J.H. Bowdre, Ph.D., Virginia Polytechnic Institute, 1976, B.S., Virginia Polytechnic. Institute, 1970

J.G. Cannon, Ph.D., University of North Carolina at Chapel Hill, 1978, B.A., University of Newark, Delaware, 1970

M.S. Cohen, M.D., Rush Medical College, 1974, B.S., University of Illinois, Urbana, 1971

R.A. Eisenberg, M.D., Stanford University, 1971, B.A., Haverford College, 1966

R.L. Hopfer, Ph.D., Oklahoma State University, 1972, B.S., Oklahoma State University, 1967

J.E. Newbold, Ph.D., California Institute of Technology, 1970, B.Sc., University of Birminghan, England, 1962

H.M. Reisner, Ph.D., Case Western Reserve University, 1973, B.S., City College of New York, 1967

R. Twarog, Ph.D., University of Illinois, 1962, M.S., University of Connecticut, 1958, B.S., University of Connecticut, 1956

ASSISTANT PROFESSOR

S.H. Clarke, Ph.D., University of Maryland, 1982, B.S., University of Maryland, 1977

S.A. Fiscus, Ph.D., Colorado State University, 1986, M.A., Duke University, 1971, B.S., Bates College, 1968

P.H. Gilligan, Ph.D., University of Kansas, 1978, B.A., College of the Holy Cross, 1973

I. Hunt, Ph.D., University of Pittsburgh, 1983, B.S., Maryland University College, 1975

D.C. Lee, Ph.D., University of Washington, 1979, B.S., Stanford University, 1973

N. Raab-Traub, Ph.D., University of Chicago, 1980, B.S., University of Michigan, 1969

R.G. Rohwer, Ph.D., California Institute of Technology, 1975, B.S., University of Wisconsin, 1967

R.H. Snodgrass, Ph.D., University of Pennsylvania, 1980, B.S., University of Arizona, 1976

J.P. Ting, Ph.D., Northwestern University, 1979, B.S., Illinois State University, 1975

S.L. Watts, Ph.D., Duke University, 1978, B.S., Duke University, 1974

INSTRUCTOR

B.F. Maxwell, B.A., University of North Carolina, Greensboro, 1951

LECTURER

D.D. Dalton, Ph.D., University of North Carolina at Chapel Hill, 1969, B.S., Cornell University, 1962

RESEARCH ASSISTANT PROFESSOR

M.J. Agostino, Ph.D., State University of New York, Buffalo, 1982, B.S., Southeastern Massachusetts University, 1977

L.W. Arnold, Ph.D., University of Nebraska, 1979, M.S., University of Nebraska, 1976, B.S., University of Nebraska, 1973

J.F. Baskar, Sc.D., Johns Hopkins University, 1975, M.S., Howard University, 1967, B.S., University of Madras, India, 1959

G.A. Bishop, Ph.D., University of Michigan, 1983, M.S., University of Wisconsin, 1979, M.S., St. Olaf College, 1977 (Resigned July, 1989)

N.L. Davis, Ph.D., University of Wisconsin, 1972, M.S., University of Wisconsin, 1970, M.S., Pomona College, 1967

VISITING RESEARCH ASSISTANT PROFESSOR

J.R. Kamine, Ph.D., University of Texas, Austin, 1972, B.A., University of Texas, Austin, 1967 (Resigned November, 1989)

Courses for Graduates and Advanced Undergraduates

105. MOLECULAR AND CELLULAR BASIS OF PROKARYOTIC MICROBIOLOGY (4). Prerequisites: organic chemistry, and permission of department except for departmental majors. Basic concepts of the structure, metabolism, growth and reproduction, genetics and control and regulation of prokaryotes. Four lecture hours a week. Spring. Cannon, staff.

108. ADVANCED MOLECULAR BIOLOGY I (Genetics 110, Biochemistry 110, Pharmacology 136, Biology 178) (3). DNA structure, function and interactions in prokaryotic and eukaryotic systems, including chromosome structure, replication, recombination, repair and genome fluidity. Three lecture hours. Fall. Griffith, staff.

112. INTRODUCTION TO MICROBIOLOGY (3). Open only to dental students. A course covering basic aspects of microbiology including sterilization, disinfection, action of antimicrobial chemotherapeutic agents, concepts of infection and immunity and the study of certain selected infectious agents. Forty-three lecture hours and twelve laboratory hours. Spring. Gooder, staff.

114. IMMUNOBIOLOGY (3). Prerequisites: Biology 11, or Biology 21, or Microbiology 51 or 55, and Chemistry 11, 21. For students with primary focus other than immunology. Immunochemistry; genetic control, regulation and development of cells and cell interactions; hypersensitivity, autoimmunity, resistance to infection. Two lectures, one seminar. Fall. Schwab.

115. SPECIAL TOPICS IN BACTERIOLOGY OR IMMUNOLOGY (3 or more each semester). Permission of the Department required except for departmental majors. Designed to introduce the student to research methods. Minor investigative problems are conducted with advice and guidance of the staff. May be repeated for credit two or more semesters. Hours and credit to be arranged, any term. Staff.

120. MICROBIAL PATHOGENESIS (4). Prerequisites: Microbiology 105, 110. Molecular and biological basis of pathogenic properties of bacteria. Four lecture hours per week. Spring. Cannon, staff.

130. VIROLOGY (4). Prerequisites: Microbiology 105, 110. Current concepts of the chemistry, structure, replication, genetics and natural history of animal viruses and their host cells. Four lecture hours a week. Spring. Bachenheimer.

156. GROWTH CONTROL IN NORMAL AND NEOPLASTIC CELLS (3). Topics will include growth factors and their receptors, signal transduction, oncogenes and anti-oncogenes. Three lecture hours. Fall. Lee.

189. NUCLEIC ACID TECHNIQUES (Biology 189, Genetics 189) (4). Prerequisites: some molecular biology, permission of instructor. An intensive course covering many aspects of recombinant DNA technology such as: cDNA preparation, gel analysis, southerns, nick translations, Berk-Sharp analysis, library analysis and DNA sequencing. Eight laboratory hours. Spring. Kelly.

190. EUKARYOTIC GENE ORGANIZATION (Genetics 190) (3). Prerequisites: Organic Chemistry, permission of instructor. Basic concepts of classical chromosomal structure, function and mechanics. Eukaryotic molecular genetics and cellular regulation will be emphasized. Readings, short answer examinations, term projects. Four lecture hours. Spring. Staff.

192. MEDICAL MYCOLOGY (Biology 192, Parasitology 192) (4). Prerequisites: general microbiology or botany and permission of instructor. Isolation, identification, epidemiology, mycoserology, and clinical importance of medically significant fungi. Identification of hyphomycetes and yeasts will be stressed. Two lecture and four laboratory hours a week. Fall. Staff.

Courses for Graduates

201,202. SEMINAR IN MICROBIOLOGY (1 each). Discussion of selected topics in Microbiology. Fall and spring. Staff.

210. SEMINAR/TUTORIAL IN MICROBIAL CHEMISTRY AND GENETICS (3). One or two faculty and a small number of students will consider in depth current research of importance. Emphasis will be on current literature, invited speakers, etc., rather than textbooks. Fall. Staff.

211. SEMINAR/TUTORIAL IN ANIMAL VIROLOGY (3). One or two faculty and a small number of students will consider in depth current research of importance. Emphasis will be on current literature, invited speakers, etc., rather than textbooks. Fall. Staff.

212. SEMINAR/TUTORIAL IN IMMUNOLOGY (3). One or two faculty and a small number of students will consider in depth current research of importance. Emphasis will be on current literature, invited speakers, etc., rather than textbooks. Spring. Staff.

213. SEMINAR/TUTORIAL IN THE BIOLOGY OF CANCER: VIRUSES AND THE IMMUNE RESPONSE (3). One or two faculty and a small number of students will consider in depth current research of importance. Emphasis will be placed on current literature, invited speakers, etc., rather than textbooks. (Not offered 1989.) Fall. Staff.

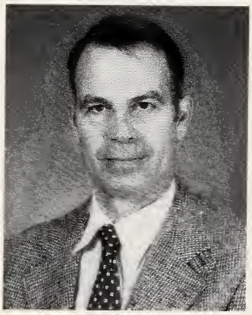
301. RESEARCH IN BACTERIOLOGY OR IMMUNOLOGY (3 or more each semester). Permission of the department required. Designed to introduce the student to research methods and special techniques. Short term problems are conducted with advice and guidance of the staff. May be repeated for credit two or more semesters. Hours and credit to be arranged, any term. Staff.

393. MASTER'S THESIS (3 or more each semester). Staff.

394. DOCTORAL DISSERTATION (3 or more each semester). Staff.

400. GENERAL REGISTRATION (0)

The Department of Neurology



The study of neurology, an essential part of general medicine education, offers valuable preparation for general medicine, pediatrics and surgery as well as the specialties of adult and child neurology, neurosurgery, neuro-ophthalmology, neuropathology and neuroradiology. The rapid expansion of basic and clinical neuroscience knowledge provides a challenge to the excellence of neurological medical education. The UNC Department of Neurology participates in interdepartmental courses (Years I-III) and offers electives in research, adult neurology and child neurology. The goals of the undergraduate neurological curriculum are mastery of the following: 1) neurological exam; 2) principles of topographic neurological localization; 3) cardinal manifestations of neurological disease; 4) laboratory investigation of neurological disease; 5) specific neurological disorders. Adult and child neurological postgraduate residencies, approved by the American Board of Psychiatry and Neurology, are available. Fellowship programs in Clinical Neurophysiology, Neuromuscular Diseases, Epilepsy, Pain and AIDS are offered. Inquiries to (919) 966-2526.

DEPARTMENT CHAIR

James N. Hayward, (H. Houston Merritt Distinguished Professor), M.D., Tufts University, 1954

PROFESSOR

T.W. Farmer, (Sarah Graham Kenan Professor of Neurology) M.D., Harvard University, 1941, M.A., Duke University 1937, A.B., Harvard University, 1935

C.D. Hall, M.D., Aberdeen University, 1966

J.N. Hayward, (H. Houston Merritt Distinguished Professor of Neurology) M.D., Tufts University, 1954, B.S., Tufts University, 1950

R.N. Johnson, Sc.D., University of Virginia, 1969, M.S., Worcester Polytechnic Institute, 1965, B.S., Tri-state College, 1961

K. Suzuki, (Director, Biological Sciences Research Center) M.D.,

ASSOCIATE PROFESSOR

A.L. Ehle, M.D., University of Washington, 1967, M.S., University of Washington, 1967, B.S., Washington State University, 1962

R.S. Greenwood, M.D., University Texas, Galveston, 1968, B.A., University of Texas, Austin, 1965

J.J. Howard, M.D., University of Vermont, 1974, B.A., University of Vermont, 1970

J.D. Mann, M.D., Cornell University, 1969, B.A., Amherst College, 1965

J.A. Messenheimer, M.D., John Hopkins University, 1970, B.S., Mount Union College, 1966

ASSISTANT PROFESSOR

R. Meeker, Ph.D., Bowling Green State University, 1976, M.A., Bowling Green State University, 1974, B.S., Bowling Green State University, 1971

C.R. Snyder, M.D., University of Washington, 1974, B.A., University of Utah, 1963

M.B. Tennison, M.D., Harvard University, 1975, B.S., Emory University, 1971

RESEARCH ASSISTANT PROFESSOR

S.R. Quint, Ph.D., University of Virginia, 1977, B.S., Virginia Polytechnic Institute, 1969

CLINICAL ASSOCIATE PROFESSOR

T.G. Braun, M.D., University of Alberta, 1961

CLINICAL ASSISTANT PROFESSOR

J.W. Wilkins, Ph.D., University of North Carolina at Chapel Hill, 1980, B.A., University of North Carolina at Chapel Hill, 1976

The Department of Obstetrics and Gynecology

The Department of Obstetrics and Gynecology has as its mission quality education for medical students and residents, innovative research, and quality patient care. In its mission relative to quality education for medical students and residents, there are faculty not only at the University of North Carolina Hospitals, but also at Wake Medical Center in Raleigh, New Hanover Memorial Hospital in Wilmington, Charlotte Memorial Hospital in Charlotte and Moses Cone Memorial Hospital in Greensboro. Of those residents who have completed this program, 22 are now in academic medicine and 62 are practicing in North Carolina. In providing quality patient care to the people of North Carolina, the department is fortunate to have among its faculty highly recognized specialists in maternal/fetal medicine, gynecologic oncology, reproductive endocrinology and general gynecology. Its programs in high-risk obstetrics, fetal surgery, in vitro fertilization and gynecologic oncology are effective and productive. The research activities now ongoing include studies on endometriosis, fetal heart monitoring, and chemotherapy protocols for cancer patients.

DEPARTMENT CHAIR

William Droegemueller, (Robert A. Ross Distinguished Professor of Obstetrics and Gynecology), M.D., University of Colorado, 1960

PROFESSOR

W.A. Bowes, (Upjohn Distinguished Professor of Obstetrics and Gynecology) M.D., University of Colorado, 1959, B.S., Washington and Lee University, 1955

R.C. Cefalo, (Assistant Dean for Graduate Medical Education) M.D., Tufts University, 1959, Ph.D., Georgetown University, 1974, A.B., Boston College, 1955

W. Droegemueller, (Robert A. Ross Distinguished Professor of Obstetrics and Gynecology) M.D., University of Colorado, 1960, B.A., University of Colorado, 1956

J.W. Easterling, (Associate Dean for Continuing Medical Education and Alumni Affairs) M.D., University of North Carolina at Chapel Hill, 1956, A.B., Duke University, 1952

W.C. Fowler, (Leonard Palumbo Professor of Gynecologic Oncology) M.D., University of North Carolina at Chapel Hill, 1966, B.S., University of North Carolina at Chapel Hill, 1961

M.J. Gray, (Assistant Dean for Student Affairs) M.D., Washington University 1949, M.S., Columbia University 1954, M.S., Swarthmore College, 1945

J.S. Haskill, Ph.D., University of Toronto, 1966, M.A., University of Toronto, 1964, B.S., University of Toronto, 1962

C.H. Hendricks, M.D., University of Michigan, 1943, A.B., University of Michigan, 1941 (Resigned December, 1988)

J.F. Hulka, M.D., Columbia University, 1956, A.B., Harvard University, 1952

E.N. Kraybill, M.D., University of Pennsylvania, 1962, B.S., Eastern Mennonite College, 1958

M.G. O'Rand, Ph.D., Temple University, 1972, M.S., Oregon State University, 1969, A.B., University of California, Berkeley, 1967

L.M. Talbert, M.D., University of Virginia, 1953

L.A. Walton, M.D., State University of New York, 1964, B.S., State University of New York, Downstate, 1959

ASSOCIATE PROFESSOR

J.R. Bobitt, M.D., University of Illinois, 1964

M.R. Clark, Ph.D., University of Michigan, 1976, B.S., University of Michigan, 1972

B.C. Corke, M.D., University of Sheffield, 1961, F.A.A., Royal College of Surgeons, 1971 (Resigned June, 1989)

J.G. Daley, M.D., Yale University, 1955, B.A., American International College, 1951

J.L. Granados, M.D., University of Madrid, 1966

J.B. Hall, M.D., Medical University of South Carolina, 1974, A.B., Taylor University, 1969 (Resigned December, 1988)

M.G. Hammond, M.D., University of Florida, 1974, M.S., University of Washington, 1967, M.S., University of Pennsylvania, 1964

W.N. Herbert, M.D., Bowman Gray School of Medicine, 1972, A.B., Elon College, 1968

J.C. Hisley, M.D., University of Maryland, 1965, B.A., Washington and Lee University, 1960 (Resigned August, 1989)

J.W. Seeds, M.D., University of Virginia, 1972, B.S., University of Washington, 1968

R.W. Swan, M.D., Northwestern University, 1965, B.A., Northwestern University, 1962

ASSISTANT PROFESSOR

N.C. Chescheir, M.D., University of North Carolina at Chapel Hill, 1982, B.S., University of North Carolina at Chapel Hill, 1977

D.J. Dotters, M.D., University of California, Los Angeles, 1979, B.A., University of California, Berkeley, 1974

V.L. Katz, M.D., University California, Los Angeles, 1979, B.S., University California, Los Angeles, 1974

D.H. Moore, M.D., Indiana University, 1982, B.A., Wabash College, 1978

G. Mulvaney, M.D., Boston University, 1978, B.A., Boston University

R.B. Shabanowitz, Ph.D., Kent State University, 1984, M.S., Kent State University, 1979, M.S., Elmira College, 1975

G.M. Tosky, M.D., Bowman Gray School of Medicine, 1981, B.S., Cornell University, 1975

L. Van Le, M.D., University of California, 1983, B.S., Stanford University, 1979

RESEARCH ASSISTANT PROFESSOR

K.M. Eyster, Ph.D., University of Arizona, 1984, B.S., Southern Western Oklahoma State, 1979 (Resigned November, 1988)

M.K. Moos, M.P.H., University of North Carolina at Chapel Hill, 1978, F.N.P., University of California, Los Angeles, 1973, B.S., University of Washington, 1970

CLINICAL ASSOCIATE PROFESSOR

J.K. Halme, Ph.D., University of Helenski, 1970, M.D., University of Helenski, 1968, M.B., University of Helenski, 1964

CLINICAL ASSISTANT PROFESSOR

C.C. Egley, M.D., University of Illinois, 1968, B.A., 1964

D.M. Linster, M.D., University of North Carolina at Chapel Hill, 1978, B.S., Livingstone College, 1974

D.E. Miller, Ph.D., Duke University, 1971, M.S., Duke University, 1965, B.S., North Carolina State University, 1962

J.M. Thorp, M.D., East Carolina University, 1983, B.A., University of North Carolina at Chapel Hill, 1979

CLINICAL INSTRUCTOR

S.G. Albright, M.S., The State University of Rutgers, 1977, B.S., Florida State University, 1975, A.A., Tallahassee Community College, 1972 (Resigned June, 1989)

M.B. Lincoln-Boyea, M.S., Sarah Lawrence College, 1986, B.A., Albion College, 1984

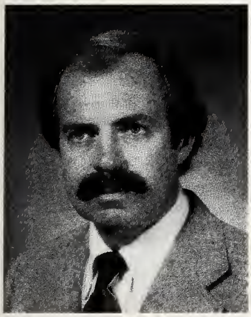
L.H. Lingley, M.S., Sarah Lawrence College, 1983, B.S., University of Massachusetts, 1979

H.N. Rucker, M.S., University of South Carolina, 1989, M.Ed., Lynchburg College, 1986, B.S., Lynchburg College, 1985

VISITING RESEARCH ASSISTANT PROFESSOR

K. Olafsson, M.D., University of Iceland, 1985 (Resigned June, 1989)

The Department of Ophthalmology



The Department of Ophthalmology provides clinical subspecialty services in neuro-ophthalmology, medical and surgical retinal disease, corneal surgery and external disease, pediatric ophthalmology, glaucoma, low vision, clinical and experimental ocular pathology, oculo-plastic surgery and inpatient consultations. The basic missions of teaching, research, and patient care are accomplished through these subspecialty services. The department is interested in teaching at all levels and provides didactic lectures, conferences, and clinical rotations for medical students on the first, second, third and fourth year levels. The three-year departmental residency program consists of nine residents with three in each year's class. Continuing medical education conferences are provided for practicing ophthalmologists in all areas of ophthalmology at least every third month. The Ophthalmology Department is not only active in clinical research, but permanent laboratory space is available for basic science research projects as well.

DEPARTMENT CHAIR

David E. Eifrig, (Dr. and Mrs. Sterling A. Barrett Professor of Ophthalmology), M.D., Johns Hopkins University, 1960

PROFESSOR

K.L. Cohen, M.D., University of Illinois, 1971, B.S., University of Michigan, 1967

D.E. Eifrig, (Dr. and Mrs. Sterling A. Barrett Professor of Ophthalmology) M.D., Johns Hopkins University, 1960, B.A., Carleton College, 1956

B.S. Grimson, M.D., Duke University, 1969, B.A., Washington and Lee University, 1965

J.R. Peiffer, D.V.M., University of Minnesota, 1971, B.S., University of Minnesota, 1969

A.E. Stuart, Ph.D., Yale University, 1969, B.A., Swarthmore College, 1965

ASSOCIATE PROFESSOR

T.W. Bouldin, M.D., University of North Carolina at Chapel Hill, 1974, A.B., University of North Carolina at Chapel Hill, 1970

K.K. Sulik, Ph.D., University of Tennessee, 1976, B.S., Drake University, 1970

ASSISTANT PROFESSOR

J.U. Davis, M.D., Duke University, 1980, D.D.S., University of North Carolina at Chapel Hill, 1977, B.S., Wake Forest University, 1973

J.A. Kylstra, M.D., Duke University, 1983, A.B., Dartmouth College, 1979

R.M. Lewen, M.D., University of Health Sciences, 1980, B.S., Bucknell University, 1976 (Resigned January, 1989)

D.A. Nichols, M.D., University of Minnesota, 1980, B.A., University of Minnesota, 1976 (Resigned July, 1988)

S.Y. Wong, M.D., Louisiana State University, 1980, B.S., University of New Orleans, 1976

LECTURER

J.P. Pantell, B.S.A., Rochester Institute of Technology, 1971

G.L. Ware, B.A., University of North Carolina at Chapel Hill, 1975, A.A., Durham Technical Institute, 1978 (Resigned December, 1989)

CLINICAL ASSISTANT PROFESSOR

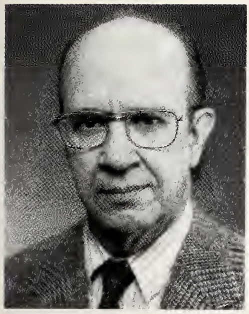
H.T. Lewis, B.S., Columbia University, 1940

D.D. Perry, M.D., University of North Carolina at Chapel Hill, 1980, B.S., North Carolina Central University, 1976

CLINICAL INSTRUCTOR

M.S. Sullivan, C.E.R., Emory University, 1970, B.A., Mills College, 1968

The Department of Pathology



The major goal of the Department of Pathology is to achieve excellence in teaching, diagnostic services and research. The faculty members of the Department of Pathology are active in each of these three areas of responsibility. Faculty provide instruction to students, residents and fellows about basic and advanced aspects of pathology, including the application of pathology and laboratory medicine to medical practice, and the elucidation and application of new observations from research studies. We operate the diagnostic laboratories of University of North Carolina Hospitals and provide diagnostic interpretation of the data produced to patients and their physicians. Research studies on selected aspects of the cause and mechanisms of lesions and diseases that afflict humans and other animals undergirds our efforts in teaching and diagnosis.

DEPARTMENT CHAIR

Joe W. Grisham, M.D., Vanderbilt University, 1957

PROFESSOR

F.B. Askin, M.D., University of Virginia, 1964, B.A., University of Virginia, 1960

S.A. Bentley, M.D., University of London, 1966, M.B., University of London, 1966, B.S., University of London, 1966

H.A. Cooper, M.D., University of Kansas, 1964, B.A., University of Kansas, 1960

R.E. Cross, Ph.D., University of Florida, 1971, M.S., University of Toledo, 1967, B.S., University of Toledo, 1965

F.G. Dalldorf, M.D., Cornell University, 1958, A.B., Bowdoin College, 1954

J.D. Folds, Ph.D., Medical College of Georgia, 1967, B.S., University of Georgia, 1962

D.T. Forman, Ph.D., Wayne State University, 1959, M.S., Wayne State University, 1957, B.S., Brooklyn College, 1953

J.D. Geratz, M.D., J.W. Goethe University, 1953

J.B. Graham, (Alumni Distinguished Professor of Pathology) M.D., Cornell University, 1942, B.S., Davidson College, 1938

T.R. Griggs, M.D., University of North Carolina at Chapel Hill, 1969, B.A., University of North Carolina at Chapel Hill, 1965

J.W. Grisham, M.D., Vanderbilt University, 1957, B.A., Vanderbilt University, 1953

W.D. Huffines, (Associate Dean for Basic Sciences and Medical Allied Health Professions) M.D., University of North Carolina at Chapel Hill, 1955, B.S., University of North Carolina at Chapel Hill, 1950

D.G. Kaufman, M.D., Washington University, 1968, Ph.D., Washington University, 1973, B.A., Reed College, 1966

R.D. Langdell, M.D., George Washington University, 1948 (Retired June, 1989)

R.L. Lundblad, Ph.D., University of Washington, 1965, B.S., Pacific Lutheran University, 1961

W.W. McLendon, (Director, Division of Laboratory Medicine) M.D., University of North Carolina at Chapel Hill, 1956, A.B., University of North Carolina at Chapel Hill, 1952

J.R. Peiffer, D.V.M., University of Minnesota, 1971, B.S., University of Minnesota, 1969

J.J. Pick, (Director, Division of Laboratory Animal Medicine) D.V.M., University of Georgia, 1961

R.L. Reddick, (Kenneth M. Brinkhous Distinguished Professor of Pathology) M.D., University of North Carolina at Chapel Hill, 1973, M.S., University of North Carolina at Chapel Hill, 1971, M.S., University of North Carolina at Chapel Hill, 1969

H.R. Roberts, (Sarah Graham Kenan Professor of Medicine and Pathology) M.D., University of North Carolina at Chapel Hill, 1955, B.S., University of North Carolina at Chapel Hill, 1952

D.W. Ross, M.D., University California, San Francisco, 1974, Ph.D., University of California, Berkeley, 1972, B.A., Cornell University, 1968

O. Smithies, Ph.D., Oxford University, 1951, B.A., Oxford University, 1946

K.I. Suzuki, (Director, Biological Sciences Research Center) M.D.

R.H. Wagner, Ph.D., University of Cincinnati, 1951, A.B., DePauw University, 1943

ASSOCIATE PROFESSOR

N.N. Anderson, M.D., American University of Beirut, 1963, B.S., American University of Beirut, 1959

D.A. Bellinger, Ph.D., Wake Forest University, 1981, D.V.M., University of Georgia, 1976, B.A., George Washington University, 1969

T.W. Bouldin, M.D., University of North Carolina at Chapel Hill, 1974, A.B., University of North Carolina at Chapel Hill, 1970

J.H. Bowdre, Ph.D., Virginia Polytechnic Institute, 1976, B.S., Virginia Polytechnic Institute, 1970

J. Chang, Ph.D., University of Missouri, 1971, M.S., University of Missouri, 1968, M.S., National Taiwan University, 1964

J.F. Chapman, Ph.D., University of North Carolina at Chapel Hill, 1978, M.P.H., University of North Carolina at Chapel Hill, 1976, M.S., California State University, 1972, B.A., California State University, 1968

C.S. Edgell, Ph.D., University of Pittsburgh, 1974, M.S., University of Pittsburgh, 1969, M.S., Pennsylvania State University, 1963

R. Farber, Ph.D., University of Washington, 1973, A.B., Oberlin College, 1966

D.M. Fowlkes, M.D., Cornell University, 1977, Ph.D., Cornell University, 1976, B.A., Colgate University, 1971

J.E. Hammond, Ph.D., University of Florida, 1974, B.S., Florida State University, 1968

R.L. Hopfer, Ph.D., Oklahoma State University 1972, B.S., Oklahoma State University 1967

J.C. Jennette, M.D., University of North Carolina at Chapel Hill, 1973, B.S., University of North Carolina at Chapel Hill, 1969

S.T. Lord, Ph.D., Cornell University Medical College, 1977, B.A., Mount Holyoke College, 1967

N. Maeda, Ph.D., Tohoku University, Japan, 1977, M.S., 1974, M.S., 1972

H.M. Reisner, Ph.D., Case Western Reserve University, 1973, B.S., City College of New York, 1967

R.W. Shermer, M.D., University of North Carolina at Chapel Hill, 1963, A.B., University of North Carolina at Chapel Hill, 1957

G.P. Siegal, M.D., University of Louisville, 1974, Ph.D., University of Minnesota, 1979, B.A., Adelphi University, 1970

L.M. Silverman, Ph.D., Ohio State University, 1975, B.A., Washington and Jefferson College, 1968

R.R. Tidwell, Ph.D., University of Tennessee, 1974, B.A., Murray State University, 1969

M.D. Topal, Ph.D., New York University, 1973, B.A., Adelphi University, 1967

B.E. Weissman, Ph.D., University of California, 1980, B.S., Massachusetts Institute of Technology, 1975

ASSISTANT PROFESSOR

F.C. Church, Ph.D., North Carolina State University, 1982, M.S., St. Louis. University, 1978, B.S., St. Louis University, 1975

M.L. Collins, M.D., Washington University, 1976, Ph.D., Washington University, 1977, B.S., Duke University, 1968

M. Cordeiro-Stone, Ph.D., University of Sao Paulo, Brazil, 1976, M.A., University of Sao Paulo, Brazil, 1972, B.S., University of Sao Paulo, Brazil, 1969

G.A. Dent, M.D., Duke University, 1981, B.S., Duke University, 1978

C.C. Dykstra, Ph.D., University of Georgia, 1984, M.S., University of Florida, 1978, A.B., Sweet Briar College, 1976

S.A. Fiscus, Ph.D., Colorado State University 1986, M.A., Duke University, 1971, B.S., Bates College, 1968

P.H. Gilligan, Ph.D., University of Kansas, 1978, B.A., College of The Holy Cross, 1973

K.A. High, M.D., University of North Carolina at Chapel Hill, 1978, A.B., Harvard University, 1972

M.T. Hoffman, M.D., University of Iowa, 1982, Ph.D., 1982, B.S., New Mexico State University, 1976

W.K. Kaufmann, Ph.D., University of North Carolina at Chapel Hill, 1979, B.S., Yale University, 1973

K.B. Pryzwansky, Ph.D., University of North Carolina at Chapel Hill, 1978, B.S., Pennsylvania State University, 1961

K.W. Rao, Ph.D., University of North Carolina at Chapel Hill, 1980, B.S., College of William and Mary, 1970

G.J. Smith, Ph.D., North Carolina State University Raleigh, 1975, M.S., North Carolina State University Raleigh, 1972, B.S., Providence College, 1970

T.D. Tlsty, Ph.D., Washington University, 1980, B.S., University of South Florida, 1973

J.T. Woosley, M.D., Medical College of Georgia, 1984, Ph.D., Medical College of Georgia, 1977, M.A., University of South Florida, 1973, B.A., University of South Florida, 1969

LECTURER

K.R. Willits, Jr., M.S., Duke University, 1984, A.A., Florida Junior College, 1972

RESEARCH ASSISTANT PROFESSOR

C.R. Bagnell, Ph.D., Washington State University, 1974, M.A., Appalachian State University, 1969, M.A., Elon College, 1967

K.A. Black, Ph.D., University of Iowa, 1984, B.S., Purdue University 1979

B.B. Gelman, M.D., University of Cincinnati, 1983, Ph.D., University of Cincinnati, 1978, A.B., Ohio University, 1971 (Resigned August, 1988)

L.W. Lee, Ph.D., University of Michigan, 1982, M.S., University of Michigan, 1977, A.B., University of California, 1974

S.S. Leinbach, Ph.D., Michigan State University, 1976, B.S., Cornell University, 1971 (Resigned August, 1988)

D.B. Lubahn, Ph.D., Duke University, 1983, B.S., University of South Florida, 1976

C.W. Pratt, Ph.D., Duke University, 1987, B.S., University of Notre Dame, 1982

M.S. Read, Ph.D., University of North Carolina at Chapel Hill, 1983, A.B., University of North Carolina, Greensboro, 1959

J.C. Rinehart, Ph.D., The State University of Rutgers, 1983, M.S., Georgia Institute of Technology, 1976, B.S., Georgia Institute of Technology, 1972

RESEARCH INSTRUCTOR

I.O. Donkor, Ph.D., Duquesne University, 1988, M.S., Duquesne University, 1984, B.S., University of Science and Technology, 1979 (Resigned October, 1989)

VISITING PROFESSOR

J.A. Swenberg, Ph.D., Ohio State University, 1970, D.V.M., University of Minnesota, 1966, M.S., Ohio State University, 1968, B.S., University of Minnesota, 1964

VISITING ASSOCIATE PROFESSOR

T.R. Skopek, Ph.D., Massachusetts Institute of Technology, 1979, M.S., Massachusetts Institute of Technology, 1977, M.S., Massachusetts Institute of Technology, 1977

CURRICULUM

Courses for Undergraduate Students, Suitably Qualified Graduate Students, and Health Professionals other than Medical Students

52. CLINICAL PATHOLOGY (3). Prerequisites: general chemistry and one course in zoology. An introductory course in the basic principles of human disease. Hematopathology, clinical chemistry, pathophysiology, diagnostic cytopathology, and clinical microbiology will be emphasized. 2 lecture and 2 laboratory hours a week. Spring, alternate years. Staff.

90. PATHOLOGY FOR PHYSICAL THERAPY STUDENTS (3). Prerequisites: anatomy, histology, and physiology. A series of lectures and demonstrations of pathologic processes. Required of all Physical Therapy students. Fall. Geratz.

140. INTRODUCTION TO CHEMICAL PATHOLOGY (Biochemistry 140) (3). Prerequisites: biochemistry (graduate or undergraduate), permission of instructor. Introduction to chemical pathology including the biochemical basis, methods of analysis, and clinical applications of biochemical tests. Topics may include enzymology, endocrinology, clinical toxicology-pharmacology, immunochemistry, or other selected areas. 3 lecture hours a week. Spring (1987 and alternate years). Chapman, Silverman, Cross, Hammond, Forman.

161s. PATHOLOGY (3). This course is required of all second- year medical students. Pathology runs throughout the second year of the medical school curriculum and is integrated as much as possible with the Mechanisms of Disease course. The first half of the course is a concentrated presentation of the general principles of pathology that runs three mornings per week for the first seven weeks of the fall semester. Basic mechanisms of pathobiology are stressed as cell injury and death, inflammation, thrombosis, repair, neoplasia, immunopathology, etc. are covered. The second half of the course is spread out over the rest of the year and is coordinated with the various segments of the Mechanisms of Disease course according to organ system. Various teaching methods are used including lecture, small group discussion, laboratory exercises, clinical conferences, and independent study. Examinations are concept oriented and composed of short answer essay questions and case oriented problems. An autopsy exercise is included for all students and optional Clinical Pathologic Conferences (CPC's) are available. Variable schedule, Mondays, Wednesdays, Fridays. Staff.

170. GENERAL SYSTEMIC AND CLINICAL PATHOLOGY (2). A consideration of the nature of disease from a number of aspects, emphasizing particularly the chemical, physiologic and genetic as well as the morphologic. Required of all second year dental students as part of Oral Medicine 120. Fall. Staff.

171. GENERAL SYSTEMIC AND CLINICAL PATHOLOGY (4). Prerequisite: Pathology 170. A consideration of the nature of disease from a number of aspects, emphasizing particularly the chemical, physiologic and genetic as well as the morphologic. Required of all second year dental students as part of Oral Medicine 120. Spring. Staff.

179. HUMAN PATHOBIOLOGY (3). Prerequisite: permission of instructor. This course is an introduction to the pathological basis of disease and will examine etiologies of human diseases, such as atherosclerosis and cancer with emphasis on both pathological and biological features. Three lectures weekly. Spring (1987 and alternate years). Staff.

220. NEUROPATHOLOGY (Neurobiology 220) (5). Prerequisites: Pathology 161s and permission of instructor. Systematic study of the more common diseases of the nervous system, utilizing a gross specimen collection, a microscopic slide set, current autopsy and surgical specimens, and histochemical laboratory. 2 conference and 6 laboratory hours a week. Spring and summer. Bouldin, Suzuki.

221. HEMATOPATHOLOGY (4). Prerequisite: Pathology 161s. A tutorial course to introduce the advanced student to techniques and problems of disorders of the blood. This will cover many aspects of immunohematology, disorders of erythrocytes, disorders of leukocytes, and bone marrow studies. 2 conference and 6 laboratory hours a week. Fall. Ross, Bentley.

Course Offered for Special Students in Pathology

162. EXPERIMENTAL PATHOLOGY. Prerequisites: Physiology and biochemistry. This course is designed for students interested in the study of experimentally produced pathological states. Hours, credits and instructor to be arranged.

Courses for Graduate Students

107. INTRODUCTION TO NEUROBIOLOGY (Biochemistry 107, Neurobiology 107, Pharmacology 107, Physiology 107) (3). Prerequisites: one course in the biological sciences and permission of the Director of the Neurobiology Curriculum. This is an interdisciplinary course to provide students with an integrative view of modern concepts of neurobiology pertinent to behavior and mental disease. Topics to be considered are: organization of the nervous system, neurochemistry; neurophysiology; neuropharmacology; neurogenetics; computer, etc. 3 lecture hours a week. Fall (1988 and alternate years). Staff of Neurobiology Curriculum.

163. ELECTRON MICROSCOPY (4). Prerequisite: permission of instructor. Theoretical and practical aspects of electron microscopy. Application of transmission and scanning electron microscopy to pathology, with emphasis on ultra-structure of cells and organelles. 2 lecture and 6 laboratory hours a week. Alternate years. Staff.

166. MOLECULAR BIOLOGY OF BLOOD COAGULATION (3). Prerequisite: Biochemistry 100 or 105, or permission of instructor. A comprehensive presentation of the chemistry and molecular biology of the blood coagulation mechanism including consideration of component proteins, lipids, cofactors, interaction with other hemostatic systems, and control. 3 lectures a week. Fall (1987 and alternate years). Staff.

169. INTRODUCTION TO HUMAN IMMUNOGENETICS (Genetics 169) (3). Prerequisite: permission of the instructor. A seminar course using immunological techniques to familiarize participants with genetic systems defined in humans. Includes discussion of methodology and its application to problems of interest to participants. 3 lectures a week. Fall (1988 and alternate years). Staff.

180. DNA AND CELL PATHOLOGY (Genetics 180, Biochemistry 180) (3). Prerequisites: Biochemistry 100 and permission of instructor. The basic chemistry of DNA and its associated structural and replicative proteins as it relates to mechanisms of mutagenesis and carcinogenesis. 3 lecture hours a week. Spring (1987 and alternate years). Staff.

213. PATHOLOGY FOR GRADUATE STUDENTS (5). Prerequisites: Pathology 161s or 170, and permission of the instructor. A tutorial course in human pathology. 2 seminar and 6 laboratory hours a week. Fall and spring. Staff.

214. ETIOLOGY AND PATHOGENESIS OF HUMAN DISEASE (3).Prerequisite: permission of instructor. A tutorial course covering topics such as cell injury, cell death, tissue inflammation, necrosis, repair, and carcinogenesis. Covers basic aspects of pathology in greater depth than Pathology 161s. 2 lecture and 1 seminar hours a week. Fall. Staff.

216. MODELS AND METHODS IN EXPERIMENTAL PATHOLOGY (3). Prerequisite: permission of instructor. An introduction to the use of in vivo and in vitro models in the study of disease. Special methods such as tissue culture, cell fractionation, and immunochemical procedures will be considered. 2 lecture and 1 seminar hours a week. Fall. Staff.

223. SPECIAL METHODS IN PATHOLOGY (5). Prerequisite: permission of the instructor. Conducted on a tutorial basis, with the aim of providing experience with specialized techniques including histochemistry, electron microscopy, fluorescent and phase microscopy, chromatography, electrophoresis, and ultracentrifugation. 2 conference and 6 laboratory hours a week. Spring. Staff.

228. ADVANCED TOPICS IN PROTEIN CHEMISTRY (Biochemistry 228) (3). Prerequisite: Biochemistry 100 or equivalent. Chemical approaches to the elucidation of simple and complex proteins. Special topics will include normal and abnormal hemoglobins, proteins involved in biological matrices and glycoproteins. 3 lecture hours a week. Spring. Staff.

241. SPECIAL TOPICS IN GENETICS (Genetics 241) (2). Prerequisite: permission of the instructor. Introduction to human immunogenetics. 2 lecture hours a week. Spring (1988 and alternate years). Staff of Genetics Curriculum.

259. FUNDAMENTALS OF ONCOLOGY (Epidemiology 259) (3). Prerequisite: participants must be working toward advanced degree in the health sciences, except with permission of course director. Fundamentals of the biology of cancer as well as overviews of clinical management, diagnosis and treatment. Three lectures weekly. Fall and spring. Staff.

275. GENETICS SYSTEMS (Genetics 275, Biochemistry 275, Biology 275, Pathology 275) (3). An advanced course in genetics emphasizing the genetics and molecular biology of viruses, bacteria, fungi, insects and mammals and based upon the personal research of the staff. Fall (1988 and alternate years). Staff of the Genetics Curriculum.

290. SEMINAR IN NEUROBIOLOGY (Biochemistry 290, Neurobiology 290, Pharmacology 290, Physiology 290, Biology 290) (3). Prerequisites: one graduate course in the biological sciences and permission of the Director of the Neurobiology Curriculum. An integrative consideration of selected topics and problems associated with the nervous system and behavior. 3 lecture hours a week. Fall and spring. Staff of Neurobiology Curriculum.

291. SEMINAR IN BLOOD COAGULATION (2). Prerequisite: Pathology 166 or permission of the instructor. An in-depth analysis of the current state-of-art in hemostasis research with emphasis on the molecular pathology of the clotting factors, fibrinolytic system, and platelet function. 2 lecture hours a week. Fall and spring. Staff.

292. SEMINAR IN CARCINOGENESIS (2). Prerequisite: permission of the instructor. Survey of classical and current literature on selected critical issues in carcinogenesis. Discussions consider experimental methods and observations as well as theories and generalizations. 2 seminar hours a week. Fall (1988 and alternate years). Staff.

301. SEMINAR IN PATHOLOGY (2). Prerequisite: Pathology 161s. This course consists of seminars designed to acquaint the student with recent literature in pathology, particularly as it relates to research activities carried on within the Department. 3 hours a week, to be arranged. Staff.

302, 303, 304. RESEARCH IN PATHOLOGY (3 or more hours). These courses are designed to give advanced students in pathology an opportunity to carry on investigations on the mechanism of disease. Current research programs deal with blood coagulation, hemorrhagic diatheses, thrombosis, cold injury, human genetics, pulmonary pathology, chemical carcinogenesis, hepatic injury and recovery, and immunohematology. 10 or more laboratory hours a week. Staff.

310. RESEARCH IN NEUROBIOLOGY (Biochemistry 310, Neurobiology 310, Pharmacology 310, Physiology 310, Biology 310) (3–12). Prerequisites: permission of a staff member and the Director of Neurobiology Curriculum. Research in various aspects of neurobiology. 6–24 hours a week. Fall and spring. Staff of Neurobiology Curriculum.

393. MASTER'S THESIS (3–6). Fall and spring. Staff.

394. DOCTORAL DISSERTATION (3 or more). Fall and spring. Staff.

400. GENERAL REGISTRATION (0).

The Department of Pediatrics

The principal activities of the Department of Pediatrics fall into three major categories: patient care, education, and research. Areas of interest for all of these activities include maintenance of health in well children, growth and development, psychosocial aspects of child care, and a full range of pathophysiologic processes that produce developmental disabilities and illness in children and adolescents. Patient care and teaching efforts are centered in both the inpatient and ambulatory settings of the hospital. Outreach programs link the program of the Department of Pediatrics with practicing physicians in the area, schools, and a wide variety of other child care programs. Major components of the department are located at the University of North Carolina Hospitals in Chapel Hill, Wake Medical Center in Raleigh, Moses Cone Memorial Hospital in Greensboro, and Charlotte Memorial Hospital in Charlotte.

DEPARTMENT CHAIR

Thomas F. Boat, M.D., University of Iowa, 1966

PROFESSOR

T.F. Boat, M.D., University of Iowa, 1966, M.S., University of Iowa, 1964, M.S., Central College, 1961

R.C. Cefalo, (Assistant Dean for Graduate Medical Education) M.D., Tufts University, 1959, Ph.D., Georgetown University, 1974, A.B., Boston College, 1955

J.W. Clyde, M.D., Vanderbilt University, 1954, B.A., Vanderbilt University, 1951

A.M. Collier, M.D., University of Miami, 1963, B.S., University of Miami, 1959

H.A. Cooper, M.D., University of Kansas, 1964, B.A., University of Kansas, 1960

A.J. D'Ercole, M.D., Georgetown University, 1969, A.B., University of Notre Dame, 1965

J.F. Denny, (Alumni Distinguished Professor of Pediatrics) M.D., Vanderbilt University, 1946, B.S., Wofford College, 1944

D. Dunphy, M.D., Yale University, 1944, B.A., College of the Holy Cross, 1939 (Retired June, 1989)

M.F. Durfee, M.D., University of Virginia, 1963, M.P.H., University of North Carolina at Chapel Hill, 1977, B.A., Ohio University, 1959

G.W. Fernald, M.D., University of North Carolina at Chapel Hill, 1960, B.S., University of North Carolina at Chapel Hill, 1957

F.S. French, M.D., University of Rochester, 1956, A.B., University of Kansas, 1951

J.M. Garfunkel, M.D., Temple University, 1948, M.S., Temple University, 1953

W.B. Greene, M.D., University of North Carolina at Chapel Hill, 1972, B.S., Davidson College, 1968

H. . Hamrick, M.D., University of North Carolina at Chapel Hill, 1967, A.B., University of North Carolina at Chapel Hill, 1961

F.W. Henderson, M.D., University of North Carolina at Chapel Hill, 1970, B.S., University of North Carolina at Chapel Hill, 1967

D.L. Ingram, M.D., Yale University, 1967, A.B., Harvard University, 1960

A.M. Johnson, M.D., Vanderbilt University, 1959, A.B., Asbury College, 1955

J.H. Kirkman, (Kenan Professor of Pediatrics) M.D., Johns Hopkins University, 1952, M.S., Emory University, 1950

E.N. Kraybill, M.D., University of Pennsylvania, 1962, B.S., Eastern Mennonite College, 1958

E.E. Lawson, M.D., Northwestern University, 1972, B.A., Harvard University, 1968

M.D. Levine, (Director, Clinical Center for the Study of Development and Learning) M.D., Harvard University, 1966, A.B., Brown University, 1961

C.W. McMillan, M.D., Bowman Gray School of Medicine, 1952, B.S., Wake Forest University, 1948

M.S. Miles, Ph.D., University of Missouri, 1976, M.A., University of Missouri, 1973, M.N., University of Pittsburgh, 1965, B.S.N., Boston College, 1963

C.T. Ramey, Ph.D., West Virginia University, 1969, M.A., West Virginia University, 1967, A.B., West Virginia University, 1965

M.K. Sharpless, M.D., University of North Carolina at Chapel Hill, 1959, A.B., Duke University, 1955

L.E. Underwood, M.D., Vanderbilt University, 1961, A.B., University of Kentucky, 1958

J.J. Van Wyk, (Kenan Professor of Pediatrics) M.D., Johns Hopkins University, 1948, A.B., Hope College, 1943

R.E. Wood, M.D., Vanderbilt University, 1970, Ph.D., Vanderbilt University, 1968, B.S., Stetson University, 1963

ASSOCIATE PROFESSOR

A.S. Aylsworth, M.D., University of Pennsylvania, 1967, B.S., Cornell University, 1963

C.L. Bose, M.D., Emory University, 1974, B.A., Duke University, 1970

J.L. Carson, Ph.D., University of North Carolina at Chapel Hill, 1975, B.S., Western Carolina University, 1971

P. Cheng, Ph.D., Case Western Reserve University, 1974, M.S., National Taiwan University, 1968, B.S., National Taiwan University, 1965

M. Conti, M.D., University of Rome, 1974

A.W. Cross, M.D., Columbia University, 1970, B.A., Yale University, 1966

R. Greenberg, M.D., University of Pennsylvania, 1964, M.S., University of North Carolina at Chapel Hill, 1982, A.B., Harvard University, 1960

G.W. Henry, M.D., University of North Carolina at Chapel Hill, 1977, A.B., University of North Carolina at Chapel Hill, 1973

R.T. Herrington, M.D., University of Washington, 1957, B.S., The Citadel, 1953

P. Hu, Ph.D., Michigan State University, 1973, M.S., Northwestern State University, 1966, B.S., Taiwan Normal University, 1956

D.R. Joseph, Ph.D., University of Miami, 1970, M.S., University of Miami, 1968, B.S., Florida State University, 1963

P.K. Lund, Ph.D., University of Newcastle-Tyne, 1979, B.Sc., University of Newcastle-Tyne, 1975

C.R. Morris, M.D., Baylor University, 1962, B.S., Baylor University, 1958

D.K. Runyan, M.D., University of Minnesota, Minneapolis-St. Paul, 1976, Ph.D., University of North Carolina at Chapel Hill, 1983, M.P.H., University of Minnesota, 1975, A.B., Macalester College, 1972

S.A. Schall, M.D., University of Pennsylvania, 1964, B.A., The State University of Rutgers, 1960

M.C. Sharp, M.D., Harvard University, 1974, M.A., Dartmouth College, 1972, M.A., Amherst College, 1968

B. Stabler, Ph.D., University of North Carolina at Chapel Hill, 1971, M.Ed., University of North Carolina at Chapel Hill, 1968, B.A., Bede College, England, 1967

L.D. Stein, M.D., Medical College of Georgia, 1975, B.S., Tulane University, 1971

S.W. Teplin, M.D., University of Pennsylvania, 1973, B.A., Brandeis University, 1969

M.H. Ulshen, M.D., University of Rochester, 1969, B.A., University of Rochester, 1965

B.E. Weissman, Ph.D., University of California, 1980, B.S., Massachusetts Institute of Technology, 1975

J.K. Whitt, Ph.D., University of Texas, Austin, 1976, B.A., University of Virginia, 1968

E.M. Wilson, Ph.D., Vanderbilt University, 1974, B.A., Ohio Wesleyan University, 1970

A.L. Zaritsky, M.D., University of Maryland, 1976, B.A., University of Pennsylvania, 1972

ASSISTANT PROFESSOR

O.B. Akintemi, M.B., University of Ibadan Medical School 1977, B.S., University of Ibadan Medical School, 1977

J.C. Azizkhan, Ph.D., University of Maryland, 1978, M.S., University of Maryland, 1974, B.S., Dickinson College, 1972

R.G. Azizkhan, M.D., Pennsylvania State University, 1975, B.S., Dickinson College, 1972

W.L. Coleman, M.D., University of New Mexico, 1979, M.A., University of California, Berkeley, 1969, M.A., University of The Americas, 1967

E.G. Frantz, M.D., Milton Hershey Medical Center, 1981, B.S., Manchester College, 1977

S.H. Gold, M.D., Vanderbilt University, 1981, B.A., Vanderbilt University, 1977

R.C. Henderson, M.D., University of Chicago, 1980, Ph.D., University of Chicago, 1978, B.S., University of Illinois, 1973

M.M. Henry, M.D., University of North Carolina at Chapel Hill, 1977, B.A., University of North Carolina at Chapel Hill, 1973

G.R. Jones, M.D., University of Oregon, 1980, B.S., Oregon State University, 1976

S.T. Lawless, M.D., State University of Rutgers, 1981, B.S., Fordham University, 1977

M.W. Leigh, M.D., Eastern Virginia Medical School, 1976, A.B., Sweet Briar College, 1973

S.N. Lichtman, M.D., University of Toronto, 1978

S.D. Mattos, M.D., Federal University, Brazil, 1981, B.S., Colegio Nossa, Brazil, 1975

H. Mesrobian, M.D., American University of Beirut, 1978, B.S., American University of Beirut, 1973

K.W. Rao, Ph.D., University of North Carolina at Chapel Hill, 1980, B.S., College of William and Mary, 1970

J.M. Rhods, M.D., Johns Hopkins University, 1980, B.A., Johns Hopkins University, 1976

J.C. Smith, M.D., University of Missouri, 1975, B.A., University of Missouri, 1971

A.D. Stiles, M.D., University of North Carolina at Chapel Hill, 1977, B.A., University of North Carolina at Chapel Hill, 1974

M.B. Tennison, M.D., Harvard University, 1975, B.S., Emory University, 1971

R.W. Warren., M.D., Washington University, 1978, B.A., Yale University, 1972 (Resigned December, 1988)

D.J. Weber, M.D., University of California, San Diego, 1977, M.P.H., Harvard University, 1985, B.A., Wesleyan University, 1973

S.T. White, M.D., University of North Carolina at Chapel Hill, 1975, M.P.H., University of North Carolina at Chapel Hill, 1981, B.S., Bennett College, 1971 (Resigned July, 1988)

LECTURER

V.G. Nichols, M.D., Medical University of South Carolina, Ph.D., Duke University, 1984, B.A., Duke University 1975 (Resigned May, 1989)

RESEARCH ASSOCIATE PROFESSOR

D.A. O'Brien, Ph.D., Harvard University, 1978, B.S., University of Dayton, 1972

A.A. Sud, Ph.D., Jammu University 1982, M.S., 1974, M.S., 1972

RESEARCH ASSISTANT PROFESSOR

N.J. Charest, M.D., University of Connecticut, 1979, B.A., Wheaton College, 1975 (Resigned June, 1989)

M. Davenport, M.D., University of Kentucky, 1982, A.B., Harvard University, 1977

S.H. Hall, Ph.D., North Carolina State University, 1984, M.S., North Carolina State University, 1970, M.S., University of North Carolina at Chapel Hill, 1967

J.A. Hofheimer, Ph.D., University of Florida, 1979, M.Ed., University of North Florida, 1975, B.S., Florida State University, 1973 (Resigned November, 1989)

D.B. Lubahn, Ph.D., Duke University, 1983, B.S., University of South Florida, 1976

G.Z. Retsch-Bogart, M.D., University of Cincinnati, 1978, B.S., University of Cincinnati, 1974

E.P. Smith, M.D., Duke University, 1979, B.A., Dartmouth College, 1975 (Resigned June, 1988)

M.E. Svoboda, Ph.D., Indiana University, 1975, M.S., University of Wisconsin, 1947, B.S., University of Wisconsin, 1943

RESEARCH INSTRUCTOR

P.A. Muelenaer, M.D., Eastern Virginia Medical School, 1979, M.A., Georgetown University, 1976, B.S., Virginia Polytechnic Institute, 1974

CLINICAL PROFESSOR

R.C. Brownlee, M.D., Vanderbilt University, 1945, A.B., Erskine College, 1943

H.S. Harned, Jr., M.D., Yale, University, 1945, B.S., Yale University, 1941

C.S. Schroeder, Ph.D., University of Pittsburgh, 1966, M.S., University of Pittsburgh, 1963, M.S., Thiel College, 1961

D.L. Silber, M.D., Vanderbilt University, 1957, B.A., Vanderbilt University, 1954

J.D. Thullen, D.O., College of Osteopathic Medicine, 1970, B.S., Ohio Northern University, 1963

CLINICAL ASSOCIATE PROFESSOR

M.A. Rathbun, M.D., Albany Medical College, 1970, B.S., Rensselaar Polytechnic Institute, 1966

J.R. Vaughan, M.D., University of North Carolina at Chapel Hill, 1970, A.B., University of North Carolina at Chapel Hill, 1966

S. Wong, M.D., University of Malaya, Kuala, 1973

CLINICAL ASSISTANT PROFESSOR

N.P. Callanan, M.S., Sarah Lawrence College, 1977, B.S., Stonehill College, 1975

B.B. Compton, R.N., Watts School of Nursing, 1961

L.L. Dunn, M.D., Duke University, 1981, B.S., Davidson College, 1977

D.M. Frazier, Ph.D., Duke University, 1969, M.P.H., University of North Carolina at Chapel Hill, 1983, A.B., Drew University, 1964

C.F. LaForce, M.D., Jefferson Medical College, 1975, M.S., University of Florida, 1971, M.S., Northwestern University, 1968

T. Pawletko, Ph.D., Pennsylvania State University, M.S., Pennsylvania State University, 1985, B.S., Illinois State University, 1976

C.S. Poprawa, M.S., University of Pennsylvania, 1989, B.S.N., Salve Regina College, 1984

M.G. Portilla, M.D., M.Ed., 1980, B.S., University of Maryland, 1973

N.R. Rabinovich, M.A., University of North Carolina at Chapel Hill, 1988, M.D., Southern Illinois University, 1982, B.A., University of Iowa, 1976 (Resigned June, 1989)

J.E. Schwankl, M.D., University of Minnesota, 1969, M.P.H., University of North Carolina at Chapel Hill, 1974, B.S., St. Johns University, 1965

J.A. Simpson, M.D., University of South Carolina, 1981, B.S., Tufts University, 1974

M.S. Van Dyke-Niles, M.S., University of North Carolina at Chapel Hill, 1984, B.S., University of North Carolina, Greensboro, 1980 (Resigned March, 1989)

T.E. Young, M.D., Medical College of Ohio, 1979, B.A., University of Cincinnati, 1976

CLINICAL INSTRUCTOR

S.G. Albright, M.S., State University of Rutgers, 1977, B.S., Florida State University, 1975, A.A., Tallahassee Community College, 1972 (Resigned June, 1989)

P.A. Friedman, M.D., University of North Carolina at Chapel Hill, 1983, B.A., Williams College, 1977

D.S. Hostetler, M.S., University of Pittsburgh, 1985, B.S., Westminster College, 1982

M.A. Kimball, M.S., University of North Carolina at Chapel Hill, 1987, B.A., Elon College, 1967

C.M. Latta, M.S., Medical College of Virginia, 1981, B.S., Western Carolina University, 1977

C. Siegel, M.S., Sarah Lawrence College, 1986, B.S., University of South Carolina, 1984 (Resigned May, 1989)

ADJUNCT PROFESSOR

F.A. Loda, M.D., Vanderbilt University, 1960, A.B., Harvard University, 1956

ADJUNCT ASSISTANT PROFESSOR

E.E. Chapman, M.D., University of Alabama, 1970, B.S., University of Alabama, 1967 (Resigned July, 1989)

VISITING RESEARCH ASSISTANT PROFESSOR

V.E. Quarmby, Ph.D., University of London, 1980, B.S., University of London, 1974 (Resigned May, 1989)

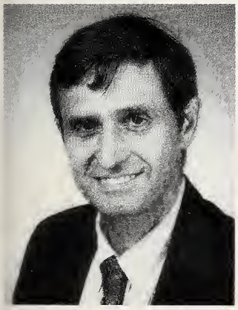
VISITING RESEARCH INSTRUCTOR

M.F. Czyzyk-Krzeska, Ph.D., Warsaw Medical School, 1988, M.D., Warsaw Medical School, 1986

VISITING CLINICAL INSTRUCTOR

F.M. Piazza, M.D., Universidad Peruana, 1982 (Resigned June, 1989)

The Department of Pharmacology



The Department of Pharmacology offers a program of study that leads to the degree of Doctor of Philosophy. The basic course requirements for the degree include introductory and advanced courses in pharmacology, and courses in related sciences in accord with the principal area of interest of the student. In addition, the student must pass written and oral doctoral examinations, write a dissertation which is based on original research, and submit to a final oral examination. Faculty research interests which serve as areas for dissertation research include drug receptor interaction, drug metabolism, mechanisms of drug toxicity and study of the mechanism of action of drugs affecting the cardiovascular, endocrine and nervous systems, as well as drugs used as chemotherapeutic agents in the treatment of malignant and viral diseases. Problems related to the mechanisms of ion transport, and regulation of drug receptor synthesis, gene expression and cell growth are all being studied with modern techniques of cellular and molecular biology. Students are expected to begin independent research early in their training and to participate in an intensive program of research seminars. The department also provides specific courses for students in the health professions which teach the principles of pharmacology as the basis for rational therapeutics. Students in the health profession schools are also encouraged to enroll in one or more of a wide variety of departmental course offerings designed to serve as electives.

DEPARTMENT CHAIR:

Rudolph L. Juliano, Ph.D., University of Rochester, 1971

PROFESSOR

Y. Cheng, Ph.D., Brown University, 1972, B.Sc., Tunghai University, Republic of China, 1966 (Resigned June, 1989)

J.R. Dingledine, Ph.D., Stanford University, 1975, B.S., Michigan State University, 1971

K.H. Dudley, Ph.D., University of North Carolina at Chapel Hill, 1963, B.S., Elon College, 1959

L.A. Dykstra-Hyland, Ph.D., University of Chicago, 1972, M.A., University of Chicago, 1968, A.B., Hope College, 1966

I.H. Earp, M.D., University of North Carolina at Chapel Hill, 1970, M.S., University of North Carolina at Chapel Hill, 1972, A.B., Johns Hopkins University, 1966

J.T. Gatzy, Ph.D., University of Rochester, 1963, B.S., Pennsylvania State University, 1958

T.K. Gray, M.D., University of Maryland, 1965, B.S., Loyola College, 1961

T.K. Harden, Ph.D., University of Mississippi, 1974, B.S., Delta State University, 1970

P.F. Hirsch, Ph.D., University of California, 1954, B.S., University of California, 1950

R.L. Juliano, Ph.D., University of Rochester, 1971, B.S., Cornell University, 1963

J.S. Kizer, M.D., Duke University, 1970, A.B., Princeton University, 1966

R.B. Mailman, Ph.D., North Carolina State University, 1974, M.S., North Carolina State University, 1972, B.S., Rutgers University, 1968

T.S. Miya, (Director, Curriculum in Toxicology), M.D., Purdue University, 1952

R.A. Mueller, M.D., University of Minnesota, 1965, Ph.D., University of Minnesota, 1966, M.S., University of Wisconsin, 1963

D.A. Ontjes, (Eunice Bernard Distinguished Professor of Medicine) M.D., Harvard University, 1964, M.A., Oxford University, 1961, M.A., University of Kansas, 1959

G.A. Scarborough, Ph.D., University of California, Los Angeles, 1966, B.S., University of Arizona, 1963

W.E. Stumpf, M.D., Humboldt University, Berlin, 1952, Ph.D., University of Chicago, 1967

R.G. Thurman, Ph.D., University of Illinois, 1968, B.S., St. Louis College of Pharmacy, 1963

S.U. Toverud, M.D., University of Oslo, 1964

ASSOCIATE PROFESSOR

H.J. Burford, Ph.D., University of Kansas, 1962, M.S., University of Mississippi, 1956, B.S., Millsaps College, 1954

L. Cubeddu, M.D., Central University, Venezuela, 1964, Ph.D., University of Colorado, 1974, M.S., Central University, Venezuela, 1968 (Resigned June, 1989)

B. Goz, Ph.D., State University of New York, 1965, B.A., Columbia University, 1958

C. Harper, Ph.D., University of Missouri, 1969, M.S., Iowa State University, 1963, M.S., Tuskegee Institute, 1961, B.S., Tuskegee Institute, 1959

R. . Kole, Ph.D., Institute of Biochemistry, Poland, 1976, M.S., Department of Chemistry, Poland, 1969, M.S., Department of Chemistry, Poland, 1968

K.D. McCarthy, Ph.D., University of Utah, 1975, B.A., University of California, Fullerton, 1971

B.S. Pallotta, Ph.D., University of Vermont, 1978, B.S., State University of New York, 1973

T. Peng, M.D., University of Geneva, 1959, B.Sc., University of Geneva, 1956

ASSISTANT PROFESSOR

E.H. Lai, Ph.D., Columbia University, 1984, B.Sc., University of Waterloo, 1979

W. Maixner, D.D.S., University of Iowa, 1983, Ph.D., University of Iowa, 1982, B.A., University of Iowa, 1975

R.A. Nicholas, Ph.D., University of California, San Diego, 1984, B.S., University of Illinois, 1977

L.V. Parise, Ph.D., University of Illinois, 1982, B.S., University of Illinois, 1976

R.L. Rosenberg, Ph.D., Yale University, 1985, M.P.H., Yale University, 1982, A.B., Oberlin College, 1977

RESEARCH ASSOCIATE PROFESSOR

P.L. Carl, (Director, The Program in Molecular Biology and Biotechnology) Ph.D., University of California, Berkeley, 1968, M.A., University of California, Berkeley, 1963, M.A., Harvard University, 1961

RESEARCH ASSISTANT PROFESSOR

J.A. Handler, Ph.D., University of North Carolina at Chapel Hill, 1987, B.S., State University of Rutgers, 1982

CLINICAL PROFESSOR

R.G. McAllister, M.D., Medical College of Virginia, 1967, B.S., Hampden-Sydney College, 1963

VISITING ASSISTANT PROFESSOR

S.S. Daoud, Ph.D., University of Kentucky, 1984, M.P., School of Pharmacy University, Sudan, 1979, B.S., School of Pharmacy University, Cairo, 1974 (Resigned January, 1989)

CURRICULUM

Courses for Health Professionals other than Medical Students

55, 56. GENERAL PHARMACOLOGY (3 each). Prerequisites: all preceding courses in chemistry, zoology, bacteriology, and physiology in the School of Pharmacy curriculum or their equivalent. A course for pharmacy students. General principles as they apply to the major drug classes will be stressed. 3 lecture hours a week. Fall and spring. Dudley.

Courses for Undergraduate Students

99. FUNDAMENTALS OF DRUG ACTION (3). Prerequisites: Zoology 11 and Organic Chemistry 62, or permission of instructors. A course to provide basic information on principles and mechanisms of drug action emphasizing science. Highlights of pharmacology will be covered rather than an exhaustive cataloging of drugs. 3 lecture hours a week. Spring. Thurman, staff.

134. PHARMACOLOGY (Dent 123) (3). A course for second year students in the School of Dentistry. 2 lecture hours a week and special assignments. Fall. Toverud, associates.

135. BIOLOGICAL SCIENCES LABORATORY (Dent 124) (3). "In-depth" laboratory experiences in pharmacology for students in the School of Dentistry. 8 laboratory and conference hours a week. Fall and spring. Toverud, associates.

Courses for Suitably Qualified Undergraduates and Graduate Students

105. TECHNIQUES IN MOLECULAR ENDOCRINOLOGY (2). Prerequisites: Biochemistry 100L, 105, or equivalent and permission of the instructor. A guide to techniques for the estimation of hormones in tissues, hormone-protein interactions, isolation and characterization of hormones and hormone-binding proteins, and hormone dynamics. 2 lecture hours a week. Fall. Staff.

106. CURRENT CONCEPTS IN MOLECULAR ENDOCRINOLOGY (2). Prerequisites: Biochemistry 100 or equivalent, and permission of the instructor. Recent research in chemical endocrinology bearing on the biology of reproduction, normal growth and development, and cancer; mechanisms of hormone action and other topics. 2 lecture hours a week. Fall. Staff.

110. TECHNIQUES IN PHYSIOLOGICAL PHARMACOLOGY (3). Prerequisites: Pharmacology 202 and permission of instructor. Students will learn and perform a variety of physiological techniques often used in classical pharmacological research. 1 lecture and 6 laboratory hours a week. Spring (1986 and alternate years). Staff.

118. NEUROENDOCRINOLOGY (Anatomy 118) (2). Prerequisite: permission of the instructor. A review of presently held concepts in neuroendocrinology with emphasis on topographical aspects of brain structures related to hormone action. Emphasis on endocrine functions as related to neuropharmacology, behavior, consolidation of memory, psychopathology, neurophysiology and neuroanatomy. 2 lecture hours a week. Spring (1986 and alternate years). Stumpf.

123. BEHAVIORAL PHARMACOLOGY (Neurobiology 123, Psychology 123) (3). Prerequisites: Pharmacology 202, or Psychology 101 and 106, or their equivalent. Basic principles of pharmacology and the experimental analysis of animal behavior will be considered in relation to drugs that affect the central nervous system. 3 lecture hours a week. Spring (1987 and alternate years). Staff.

Courses Offered for Graduate Students

201. BASIC PRINCIPLES OF PHARMACOLOGY (1). Prerequisite: permission of the instructor. Dose-effect relationships and the concept, kinetics, isolation and identification of receptors. 1 lecture hour a week. Fall. Staff.

202. PRINCIPLES OF PHARMACOLOGY AND TOXICOLOGY (Toxicology 202) (5). Prerequisites: Biochemistry 100 and Physiology 140, or their equivalents and permission of the instructor. Introduces the major areas of pharmacology and toxicology, and serves as a basis for more advanced courses such as Pharmacology 203 or 204. 5 lecture hours a week. Spring. McCarthy, associates.

203. SYNAPTIC PHARMACOLOGY (Neurobiology 203) (3). Prerequisite: Pharmacology 202 or permission of the instructor. An in-depth consideration of biochemical and physiological bases for actions of neuroactive drugs and their possible sites of action in terms of identified pathways and synapses in the brain. 3 lecture hours a week. Fall. Dingledine, Harden, McCarthy.

204. CARDIOVASCULAR AND RENAL PHARMACOLOGY (2). Prerequisites: Pharmacology 202 and permission of the instructor. Recent advances in the elucidation of the mechanisms by which cardiotonic, antidysrhythmic and diuretic agents alter cardiac and renal function. 2 lecture hours a week. Spring. Gatzy, associates.

205. INHIBITORS OF NUCLEIC ACID AND PROTEIN METABOLISM: MECHANISMS AND APPLICATIONS (2). Prerequisites: Pharmacology 202 and permission of the instructor. The mechanisms of action of inhibitors of nucleic acid and protein metabolism and how they may be used to further understanding of cellular replicatory processes, antibacterial, antiviral and anticancer chemotherapy. 2 lecture hours a week. Fall. Kole.

206. PHARMACOLOGY OF HORMONES AND VITAMINS AFFECTING MINERAL HOMEOSTASIS AND BONE METABOLISM (2). Prerequisites: Pharmacology 202 and permission of the instructor. Concepts and current research concerning the roles of parathyroid hormone, calcitonin, steroid hormones and vitamins A, C, and D in calcium homeostasis and bone mineral metabolism. 2 lecture hours a week. Spring. Toverud.

207. RECENT ADVANCES IN TOXICOLOGY (Toxicology 207) (2). Prerequisites: Pharmacology 202 and permission of the instructor. Recent advances in teratogenesis, mutagenesis, cardio-, hepato-, and pulmonary toxicology and the modes of action of toxic chemicals that are found in the environment. 2 hours a week. Fall. Gatzy, associates.

209. BIOTRANSFORMATION OF XENOBIOTICS (Toxicology 209) (2). Prerequisites: Biochemistry 100 or equivalent and permission of the instructor. Recent advances in the mechanisms by which drugs and other foreign chemicals are metabolized to active or inactive products. The importance of metabolic pathways to therapy/toxicity. 2 lecture hours a week. Fall. Harper, associates.

211, 212. INTRODUCTION TO PHARMACOLOGY RESEARCH (4 each). A course for first-year graduate students in Pharmacology. A series of research projects of limited scope, each pursued for a 12 to 20 week period under the supervision of a different faculty member. 12 laboratory hours a week. Fall and spring. Dingledine, Pallotta, associates.

213. INTRODUCTION TO PHARMACOLOGICAL RESEARCH (2). Prerequisites: Pharmacology 211 and 212. This is a continuation of Pharmacology 211 and 212. 6 laboratory hours a week. First summer session. Dingledine, Pallotta, associates.

214. INTRODUCTION TO PHARMACOLOGICAL RESEARCH (2). Prerequisites: Pharmacology 211, 212, and 213. This is a continuation of Pharmacology 211, 212, and 213. 6 laboratory hours a week. Second summer session. Dingledine, Pallotta, associates.

215. THE STRUCTURE AND FUNCTION OF CELL SURFACE MEMBRANES (2). Prerequisites: Biochemistry 100 or equivalent and permission of the instructor. Lecture course covering current concepts of the molecular nature of the cell plasma membrane and its components. 2 lecture hours a week. Fall. Scarborough.

221. TUTORIAL IN PHARMACOLOGY (3 or more). Prerequisites: Pharmacology 202 or its equivalent and permission of the staff. Students will spend 4–6 week periods with selected instructors reading in depth in specialized fields of pharmacology. Oral presentations and written reports will be required. Fall, spring and summer. Staff.

290. SEMINAR IN NEUROBIOLOGY (Biochemistry 290, Neurobiology 290, Pathology 290, Physiology 290) (3). Prerequisite: permission of the Director of the Neurobiology Curriculum. An integrative consideration of selected topics associated with the nervous system and behavior. Spring. Members of the Neurobiology Program.

301. RESEARCH IN PHARMACOLOGY (5 or more). Prerequisite: permission of the staff. Fall, spring and summer. Staff.

310. RESEARCH IN NEUROBIOLOGY (Biochemistry 310, Neurobiology 310, Pathology 310, Physiology 310, Psychology 310, Zoology 310) (3–12). Prerequisite: permission of a staff member of the Neurobiology Curriculum. Research in various aspects of neurobiology. 6–24 hours a week. Fall and spring. Members of the Neurobiology Program.

330. SEMINAR IN RECENT ADVANCES IN PHARMACOLOGY (1). Students will meet as a group with faculty members to summarize and discuss the important current pharmacological literature. 1 hour a week. Fall and spring. Gatzy, Goz.

331. SEMINAR IN GENERAL PHARMACOLOGY (1). A series of weekly lecture-seminars by graduate students, faculty members and visiting scientists on current research in pharmacology. 1 hour a week. Fall and spring. McCarthy.

393. THESIS FOR MASTER'S DEGREE (3 or more). Prerequisite: permission of the staff. Fall, spring and summer. Staff.

394. DOCTORAL DISSERTATION (3 or more). Prerequisite: permission of the staff. Fall, spring and summer. Staff.

400. GENERAL REGISTRATION (0).

The Department of Physiology

Physiology is the study of the physical and chemical factors and processes underlying the functions of living cells and organs. Research in physiology involves applying tools from the physical, chemical and biological sciences to elucidate mechanisms, interactions and means whereby functions are regulated at the molecular, cellular and organismic levels of complexity.

Two first-year medical courses, medical physiology and neurobiology, are administered and taught by the department. Courses in cellular and systemic function are offered for dental, nursing, pharmacy and other health sciences professional students.

The Department of Physiology offers a program of graduate study leading to the Ph.D. degree. Required courses include cell and organ system physiology, advanced concepts in physiology, biochemistry and biostatistics. In the first year of study, students serve rotations in faculty laboratories. Comprehensive preliminary examinations are usually taken after the second year, and a specialty examination and dissertation proposal are presented during the third year. Four to five years are generally required to complete the program. Specialized programs of study for M.D./Ph.D. students and D.D.S./Ph.D. students are available.

Vigorous research programs in cell biology—membrane function, genetic expression and molecular endocrinology; in neurobiology—cell excitability, sensory systems, synaptic transmission and signal transduction; in renal physiology and in the control of respiration and cardiovascular function are ongoing. The faculty utilizes research techniques ranging from recombinant DNA probes and ultrastructural analyses to macroscopic measurements. The department maintains electron microscopic, tissue culture, computer, machine and electronic shop facilities.

The faculty is active in the departmental graduate training program, interdisciplinary graduate curricula and service courses for health sciences students. The Department of Physiology provides exciting research opportunities for graduate students, medical students, and outstanding undergraduates.

ACTING DEPARTMENT CHAIR

Carl W. Gottschalk, (Kenan Professor of Medicine and Physiology), M.D., University of Virginia, 1945. (appointed 1/1/90)

DEPARTMENT CHAIR

Edward R. Perl, (Sarah Graham Kenan Professor of Physiology), M.D., University of Illinois, 1949; M.S., University of Illinois, 1951 (resigned as Chair 12/31/89).

PROFESSOR

W.J. Arendshorst, Ph.D., Indiana University, 1970, B.A., Depauw University, 1966

F.L. Eldridge, M.D., Stanford University, 1948, A.B., Stanford University, 1945

P.B. Farel, Ph.D., University of California, Los Angeles, 1970, M.A., University of California, Los Angel, 1967, A.B., University of California, Berkeley, 1966

R.G. Faust, Ph.D., Princeton University, 1960, M.S., University of Southern California, 1957, A.B., New York University, 1953

A.L. Finn, M.D., Boston University, 1958, A.B., Harvard University, 1954

L.S. Gettes, (Henry A. Foscue Distinguished Professor of Medicine) M.D., University of Pennsylvania, 1958, B.A., Harvard University, 1954

G.M. Langford, Ph.D., Illinois Institute of Technology, 1971, B.S., Fayetteville State College, 1966

D.L. McIlwain, M.D., Washington University, 1964, B.A., Vanderbilt University, 1960

E.R. Perl, (Sarah Graham Kenan Professor of Physiology) M.D., University of Illinois, 1949, B.S., University of Illinois, 1947

J.H. Perlmutt, Ph.D., Princeton University, 1950, M.A., University of North Carolina at Chapel Hill, 1942, B.S., College of Charleston, 1939 (Resigned June, 1989)

A. Rustioni, M.D., Parma Medical School, Italy, 1965

A.E. Stuart, Ph.D., Yale University, 1969, B.A., Swarthmore College, 1965

B.L. Whitsel, Ph.D., University of Illinois, 1965, M.S., University of Pennsylvania, 1963, M.S., Gettysburg College, 1959

L.R. Yonce, Ph.D., University of Michigan, 1955, M.S., Oregon State College, 1952, B.S., Montana State University, 1949

ASSOCIATE PROFESSOR

J.A. Cidlowski, Ph.D., Medical College of Georgia, 1975, B.A., University of South Florida, 1971

M. Conti, M.D., University of Rome, 1974

J.E. Faber, Ph.D., University of Missouri, Columbia, 1980, B.A., University of Missouri, Columbia, 1974

R.L. Glasser, Ph.D., University of Maryland, 1957, A.B., Johns Hopkins University, 1949

D.R. Joseph, Ph.D., University of Miami, 1970, M.S., University of Miami, 1968, B.S., Florida State University, 1963

A.R. Light, Ph.D., State University of New York, Upstate, 1976, B.A., Hamilton College, 1972

P.K. Lund, Ph.D., University of Newcastle-Tyne, 1979, B.Sc., University of Newcastle-Tyne, 1975

L.M. Marshall, Ph.D., University of California, Berkeley, 1976, B.S., California State University, Fresno, 1970

D.E. Millhorn, Ph.D., Ohio State University, 1978, M.S., Emory University, 1975, B.S., University of Tennessee, 1974

G.S. Oxford, (Director, Curriculum in Neurobiology) Ph.D., Emory University, 1974, B.A., Elon College, Elon, 1969

R.W. Sealock, Ph.D., Purdue University, 1972, B.S., Iowa State University, 1966

ASSISTANT PROFESSOR

M.F. Goy, Ph.D., University of Wisconsin, 1977, B.S., University of Oregon, 1971

K.C. Light, Ph.D., Syracuse University, 1976, M.A., Syracuse University, 1975, A.B., Vassar College, 1972

A.L. Willard, Ph.D., University of California, San Diego, 1978, B.S., Yale University, 1972

INSTRUCTOR

J.S. McCormick, A.B., University of North Carolina at Chapel Hill, 1969

LECTURER

J.J. Capowski, M.S., University of North Carolina at Chapel Hill, 1971, B.S., Bucknell University, 1966 (Resigned December, 1988)

RESEARCH PROFESSOR

R.T. Dowell, Ph.D., University of Iowa, 1971, M.Ed., University of Arizona, 1965, B.S., Kansas State University, 1964 (Resigned March, 1989)

RESEARCH ASSOCIATE PROFESSOR

Z. Chen, M.D., Faculty of Medicine, 1960, Ph.D., Faculty of Medicine, 1963

C.W. Davis, Ph.D., University of North Carolina at Chapel Hill, 1978, M.A., San Francisco State University, 1973, M.A., San Francisco State University, 1969

R.E. Fyffe, Ph.D., University of Edinburgh, 1979, M.S., University of Edinburgh, 1976, B.S., University of Glasgow, 1975

N.G. Moss, Ph.D., University of Wales, 1976, B.S., University of Wales, 1970

RESEARCH ASSISTANT PROFESSOR

E. Bullitt, M.D., University of Colorado, 1975, B.A., Radcliffe College, 1971

S.P. Schneider, Ph.D., Emory University, 1982, B.S., Worcester Polytechnic Institute, 1973

RESEARCH INSTRUCTOR

M.L. Meeker, Ph.D., University of North Carolina at Chapel Hill, 1986, B.S., University of Maryland, 1977

ADJUNCT ASSOCIATE PROFESSOR

J.C. Daw, (Associate Director, Medical Sciences Teaching Laboratories) Ph.D., Case Western Reserve University, 1966, B.A., Case Western Reserve University, 1959

D.A. Dreyer, Ph.D., University of Pittsburgh, 1971, B.S., University of Cincinnati, 1965

ADJUNCT LECTURER

V.K. Shea, Ph.D., Northwestern University, 1970, Ph.D., University of North Carolina at Chapel Hill, 1982

VISITING RESEARCH ASSOCIATE PROFESSOR

Z. Chen, M.D., Faculty Of Medicine, 1960, Ph.D., Faculty Of Medicine, 1963

VISITING INSTRUCTOR

B.D. Gynther, , B.S., University of Queensland, Australia, 1983, B.S., University of Queensland, Australia, 1979 (Resigned July, 1989)

J. Sato, Ph.D., Nagoya University, Japan, 1987, M.D., Tokai University, Japan, 1983 (Resigned August, 1989)

VISITING LECTURER

M.K. Azerad, , M.S., University of Paris VI, 1975, B.A., 1974, B.A., University of Paris VII, 1973

F. Zsuppan, Ph.D., Technical University of Budapest, 1985, M.S.C, 1975 (Resigned June, 1989)

CURRICULUM

Courses for Health Professionals and Qualified Undergraduate Students

90. BASIC PHYSIOLOGY (4). Prerequisites: Chemistry 11 and 21 or Biochemistry 7 and 8, Biology 45, or equivalents. A course in basic human physiology with an appreciation for its clinical relevance and application. Required of radiologic science majors and available to other students by permission of the instructor. 3 lecture and 2 laboratory-conference hours a week. Spring. Davis.

92. INTRODUCTION TO PHYSIOLOGY (5). Prerequisites: Chemistry 11 and 21 or Biochemistry 7 and 8, Biology 45 or equivalents. A course in basic human physiology and an appreciation for its clinical application. Emphasis is on body fluids, various organ systems and their interrelationships. Required of all nursing students and available to other students by permission of the instructor. 4 lecture and 2 recitation hours a week. Spring. Shea, staff.

93. INTRODUCTION TO PHYSIOLOGY (4). Prerequisites: Chemistry 11 and 21, Biology 45 or equivalents. A general course in mammalian physiology with emphasis on the various organ systems and their interrelationships. Required of all pharmacy students and available to other students by permission of the instructor. 3 lecture and 2 recitation hours a week. Fall. Whitsel, staff.

94. INTRODUCTION TO PHYSIOLOGY (5). Prerequisites: Chemistry 11 and 21, Biology 45 or equivalents. A course in basic human physiology with an appreciation for its clinical relevance and application. Required of physical therapy students and available to other students by permission of the instructor. 4 lecture and 2 laboratory-conference hours a week. Fall. Whitsel, staff.

98. UNDERGRADUATE RESEARCH IN PHYSIOLOGY (1-3). Prerequisites: Biology 11, 11L, Chemistry 11, 11L; 3.0 overall GPA and permission of the instructor. Directed readings or laboratory study on a selected topic. Final written report required in each term. Fall, spring and summer. Millhorn, staff.

Courses for Graduate and Advanced Undergraduate Students

111. BIOMEDICAL INSTRUMENTATION I (BMME 111) (3). Prerequisites: Physics 101 or equivalent, Physics 102 co-requisite and permission of the instructor. Topics include analysis of medical instrumentation with emphasis on pressure, flow, bioelectric, and ultrasonic transducers. This course includes a laboratory and interfacing microprocessors with transducers. Students are given the opportunity to design and fabricate original devices. Spring. Hsiao, Buchanan.

122. DEVELOPMENTAL NEUROBIOLOGY (Cell Biology and Anatomy 122) (3). Prerequisite: permission of the instructor. A comprehensive overview of nervous system development including detailed analysis of selected research topics in developmental neuroanatomy. Spring (alternate years). Lauder, Farel, Willard.

140. CELL AND ORGAN SYSTEM PHYSIOLOGY (Neurobiology 140) (5). This course covers the function of mammalian organs and the underlying electrical, mechanical, cellular and molecular mechanisms in a lecture/recitation format. A prior course in biochemistry facilitates understanding. Fall. Sealock, staff.

190. TEACHING OF PHYSIOLOGY (1). Prerequisite: permission of the instructor. Instruction in techniques of lecturing. Includes delivery of formal, coached lectures on topics in physiology. Fall and spring. Millhorn, staff.

Courses for Graduate Students

200. HUMAN PHYSIOLOGY (5). Prerequisite: permission of the course director. A special segment (for physiology graduate students only) of the course for medical students. The course provides a general consideration of cell function and of systemic physiology. Spring. Millhorn, staff.

201. NEUROBIOLOGY (3). Prerequisite: permission of the course director. A special segment (for physiology graduate students only) of the neurobiology course for medical students. Structural and functional organization is analyzed at the level of the cell membrane, the neuron and integrated neuronal systems. Spring. Oxford, staff.

202. ADVANCED CELLULAR PHYSIOLOGY (4). Prerequisites: Physiology 140 or equivalent, and permission of the course director. Selected topics in cellular physiology, which may include membrane transport, cell volume regulation, the cytoplasmic matrix, molecular endocrinology and gene expression, covered in depth through lectures, seminars and demonstrations. Spring. Lund, staff.

203. INTEGRATED SYSTEMS PHYSIOLOGY (4). Prerequisites: Physiology 140 or equivalent and permission of the course director. Selected topics in organ systems physiology which may include cardiovascular, renal, respiratory, endocrine and gastrointestinal physiology, covered in depth through lectures, seminars and demonstrations. Spring. Arendshorst, staff.

204. ADVANCED NEUROPHYSIOLOGY (Neurobiology 200) (4). Prerequisites: Physiology 140, working knowledge of mammalian neuroanatomy and permission of the instructor. A course designed to provide detailed analysis of selected areas of neurophysiology such as synaptic transmission, sensory and motor systems, and higher integrative mechanisms. 3 lecture and 2 laboratory hours a week. Fall. Stuart, staff.

210. PHYSIOLOGY LABORATORY ROTATION (1–6). Permission required from the Director of Graduate Studies. Rotations in faculty laboratories introduce methods and techniques in physiology. Individual projects provide an opportunity to explore potential dissertation projects. Fall, spring and summer. Graduate faculty.

211. SPECIAL TOPICS IN PHYSIOLOGY (Neurobiology 211) (3–5). Prerequisite: permission of the instructor. Individually arranged programs of study in depth in selected topics such as membrane function, transport physiology, renal physiology, etc. Fall. Staff.

212. SPECIAL TOPICS IN PHYSIOLOGY (Neurobiology 212) (3–5). Prerequisite: permission of the instructor. Individually arranged programs of study in depth of selected topics such as membrane function, transport physiology, renal physiology, etc. Spring. Staff.

217. THE COMPUTER IN THE LABORATORY (3). Prerequisites: ability to program in a high level language and permission of the instructor. Computing hardware, operating systems and languages. Data collection and analysis, A/D conversion techniques, interfacing to laboratory instruments. Elementary wave form analysis. Short programming exercises and semester project required. Fall. Staff.

220. SEMINAR IN PHYSIOLOGY (1). Prerequisite: permission of the Departmental Director of Graduate Studies. Weekly seminars emphasizing current literature. Fall. Staff.

221. SEMINAR IN PHYSIOLOGY (1). Prerequisite: permission of the Departmental Director of Graduate Studies. Weekly seminars emphasizing current literature. Spring. Staff.

225. NEURAL INFORMATION PROCESSING (BMME 221) (3). Prerequisites: BMME 103, Math 128, and Physiology 140 or equivalent. This course approaches the nervous system as a data processing network, the brain as the computer for a homeostat. Fall. Johnson.

227. CURRENT TOPICS IN PHYSIOLOGY (Biology 227) (3). Prerequisites: Biology 120 and/or permission of the instructor. Lecture and seminar consideration of selected advanced aspects of physiology. Topics will vary from year to year; may be repeated for credit. Spring. Koeppe.

240. ADVANCED CONCEPTS IN PHYSIOLOGY (5). Prerequisites: Physiology 140 or equivalent, and permission of the instructor. Advanced experimental concepts in the physiology of the neural, cardiovascular, renal and endocrine systems at the cellular and molecular levels. Spring. Perl, staff.

290. SEMINAR IN NEUROBIOLOGY (Biochemistry 290, Neurobiology 290, Pathology 290, Pharmacology 290) (3). Prerequisite: permission of the Director of the Neurobiology Curriculum. An intensive consideration of selected topics and problems. This course will focus on the development of presentation and evaluation skills. Participation required of Neurobiology Trainees. Spring. Faculty of the Neurobiology Curriculum.

301, 302, 303. RESEARCH IN PHYSIOLOGY (3–10 each). Hours to be arranged with the professor. Fall, spring and summer. Staff.

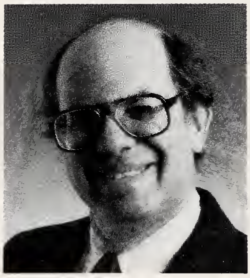
310. RESEARCH IN NEUROBIOLOGY (Biochemistry 310, Neurobiology 310, Pathology 310, Pharmacology 310, Psychology 310, Biology 202) (3–12). Prerequisite: permission of a staff member. Research in various aspects of neurobiology. 6–24 hours a week. Fall and spring. Faculty of the Neurobiology Curriculum.

393. MASTER'S THESIS (3 or more). Fall, spring and summer. Staff.

394. DOCTORAL DISSERTATION (3 or more). Fall, spring and summer. Staff.

400. GENERAL REGISTRATION (0).

The Department of Psychiatry



The Department of Psychiatry is the clinical department of the School of Medicine which conducts the School's programs of education, patient care and research in psychiatric medicine. The Department offers psychiatric evaluation and treatment through its in-patient, out-patient and consultation-liaison services in the University of North Carolina Hospitals and affiliated teaching hospitals, and it provides comprehensive educational programs for medical students, residents in psychiatry and other trainees affiliated with The University of North Carolina. Faculty members of the department conduct research programs in all major areas of modern psychiatry, including investigations of the causes, prevention and treatment of mental illness. The department strives to create and sustain academic programs of national and international importance, as well as to provide clinical services of the highest quality for those who seek psychiatric care.

DEPARTMENT CHAIR

David S. Janowsky, (Director, Center for Alcohol Studies), M.D., University of California, 1964.

PROFESSOR

J.J. Andresen, M.D., University of Pennsylvania, 1964, B.A., University of Iowa, 1961

W.E. Bakewell, (Associate Dean for Admissions) M.D., McGill University, 1949, M.A., University of Iowa, 1944, M.A., University of Northern Iowa, 1943

G.R. Breese, Jr., Ph.D., University of Tennessee, 1965, M.S., Butler University, 1961, B.S., Butler University, 1959

T.E. Curtis, M.D., Duke University, 1951

J.W. Edgerton, Ph.D., Duke University, 1953, M.A., University of Florida, 1947, B.S., Guilford College, 1940 (Retired June, 1989)

B.S. Eichelman, Ph.D., University of Chicago, 1970, M.D., University of Chicago, 1968, B.S., College of Chicago, 1964

D.L. Evans, M.D., Temple University, 1976, M.S., Bucknell University, 1972, B.S., Elizabethtown College, 1970

S. Halleck, M.D., University of Chicago, 1952, Sc.D., Rockford University, 1969, B.S., University of Chicago, 1950

D.S. Janowsky, (Director, Center for Alcohol Studies) M.D., University of California, San Francisco, 1964, B.S., University of California, San Francisco, 1961

S. Landesman, Ph.D., University of Washington, 1974, B.A., New College of the University of South Florida, 1968

R.B. Mailman, Ph.D., North Carolina State University, 1974, M.S., North Carolina State University, 1972, B.S., State University of Rutgers, 1968

G.B. Mesibov, Ph.D., Brandeis University, 1974, M.A., University of Michigan, 1968, A.B., Stanford University, 1967

M. Perez-Reyes, M.D., National University of Mexico, 1952, B.S., Colegio Frances Morelos, 1945

A.J. Prange, Jr., (Cary C. Boshamer Professor of Psychiatry) M.D., University of Michigan, 1950, B.S., University of Michigan, 1947

E. Schopler, (Director, Division for the Treatment and Education of Autistic and Related Communication Handicapped Children—TEACCH) Ph.D., University of Chicago, 1964, M.A., University of Chicago, 1955, B.S., Roosevelt University, 1952, A.B., University of Chicago, 1949

R.F. Spencer, M.D., Harvard University, 1959, B.S., Yale University, 1956

K. Suzuki, M.D., Tokyo University, 1959, A.B., Tokyo University, 1955

ASSOCIATE PROFESSOR

J.J. Boswell, M.D., University of Virginia, 1957, B.S., North Carolina State University, 1949

S.W. Carson, Pharm.D., University of Florida, B.S., University of Florida

J.C. Garbutt, M.D., University of Illinois, 1975, B.A., University of Illinois, 1971

R.N. Golden, M.D., Boston University, 1979, B.A., Yale University, 1975

C.T. Gualtieri, M.D., Columbia University, 1969, A.B., Columbia University, 1965 (Resigned October, 1988)

J.J. Haggerty, M.D., University of Maryland, 1971, B.S., Marquette University, 1967

B.E. James, Ph.D., Florida State University, 1965, M.S., Florida State University, 1963, M.S., Winthrop College, 1961

E.W. Jensen, M.D., Case Western Reserve University, 1969, B.A., Pomona College, 1963

M.H. Lewis, Ph.D., Vanderbilt University, 1980, M.A., Western Michigan University, 1975, M.A., Bowden College, 1972

H.P. Lineberger, M.D., University of North Carolina at Chapel Hill, 1954, A.B., Catawba College, 1950

M.B. Liptzin, M.D., University of Rochester, 1959, A.B., Columbia University, 1955

L.M. Marcus, Ph.D., University of Minnesota, 1972, B.A., University of Pennsylvania, 1967, B.A., Princeton University, 1965

C.F. McCartney, (Associate Dean for Student Affairs) M.D., Northwestern University, 1971, B.S., Northwestern University, 1969

N.J. Parren, Ph.D., St. Louis University, 1979, M.S., St. Louis University, 1976, M.S., Duke University, 1973 (Resigned June, 1989)

B. Stabler, Ph.D., University of North Carolina at Chapel Hill, 1971, M.Ed., University of North Carolina at Chapel Hill, 1968, B.A., Bede College, England, 1967

C.A. Taylor, M.D., University of Tennessee, 1957, B.S., Carson Newman College, 1950

M.E. Van Bourgondien, Ph.D., University of Washington, 1979, B.A., Connecticut College, 1974

J.K. Whitt, Ph.D., University of Texas, Austin, 1976, B.A., University of Virginia, 1968

ASSISTANT PROFESSOR

L.J. Barnhill, M.D., Bowman Gray School of Medicine, 1975

B.W. Boat, Ph.D., Case Western Reserve University, 1977, M.A., University of Iowa, 1966, M.A., Macalester College, 1962

M.M. Bristol, Ph.D., University of North Carolina at Chapel Hill, 1979, M.A., University of Utah, 1971, A.B., Nazareth College, 1963

M.C. Chandler, M.D., University of Wisconsin, 1982, B.A., 1978

B.G. Kirkley, Ph.D., Washington University, 1982, A.B., University of North Carolina at Chapel Hill, 1976

K.C. Light, Ph.D., Syracuse University, 1976, M.A., Syracuse University, 1975, A.B., Vassar College, 1972

K.Y. Little, M.D., Medical College of Georgia, 1980, B.A., Emory University, 1975

C.A. Pedersen, M.D., University of North Carolina at Chapel Hill, 1979, B.A., Duke University, 1971

G.M. Straw, M.D., Ohio State University 1976, B.S., Purdue University, 1972

INSTRUCTOR

K.R. Robertson, Ph.D., Oklahoma State University, 1988, M.A., Western Carolina University, 1984, B.S., 1982

LECTURER

J.S. Hutcheson, Jr., B.S.E., North Carolina State University, 1964

RESEARCH ASSOCIATE PROFESSOR

G.A. Mason, Ph.D., Duke University, 1974, A.B., University of North Carolina at Chapel Hill, 1967

RESEARCH ASSISTANT PROFESSOR

J.D. Caldwell, Ph.D., Michigan State University, 1983, B.S., University of Iowa, 1975

H.E. Criswell, Ph.D., Southern Illinois University, 1974, M.A., Western Washington State College, 1967, B.S., University of Washington, 1965

J.T. Hernandez, Ph.D., North Carolina State University, 1988, M.S., University of North Carolina at Chapel Hill, 1971, B.S., University of Rochester, 1967

A. Sherwood, Ph.D., University of Hull, England, 1982, B.Sc., University of Hull, England, 1978

CLINICAL PROFESSOR

R.U. Florenzano, M.D., University of Chile, 1968, M.P.H., University of North Carolina at Chapel Hill, 1975, B.A., Instituto Nacional, Chile, 1960

C.S. Schroeder, Ph.D., University of Pittsburgh, 1966, M.S., University of Pittsburgh, 1963, M.S., Thiel College, 1961

A.J. Wall, Ph.D., University of North Carolina at Chapel Hill, 1971, B.A., Greensboro College, 1963

CLINICAL ASSOCIATE PROFESSOR

J.R. Cowan, (Director, Student Health Services) M.D., University of Oklahoma, 1958

R.D. Cox, Ph.D., University of Virginia, 1973, M.A., University of Virginia, 1970, M.A., 1968

H.L. Frazier, M.D., Bowman Gray School of Medicine, 1966, B.S., North Carolina State University, 1962

W.H. Friedman, Ph.D., University of Connecticut, 1964, M.A., University of Connecticut, 1960, M.A., University of Kansas, 1958

J.T. Konanc, Ph.D., University of North Carolina at Chapel Hill, 1972, B.A., Occidental College, 1962

C. Lord, Ph.D., Harvard University, 1976, B.A., University of California, 1971

I.B. Pisetsky, M.D., Albert Einstein College, 1971, A.B., Stanford University, 1967

J.J. Soltys, M.D., Harvard University, 1959, B.S., University of Massachusetts, 1953

T.C. Toomey, Ph.D., University of Georgia, 1971, M.S., University of Georgia, 1970, A.B., East Carolina University, 1966

CLINICAL ASSISTANT PROFESSOR

R.M. Batson, M.D., Louisiana State University, 1977

H.T. Brantley, Ph.D., Duke University, 1973, B.A., Duke University, 1963

D.R. Chartier, Ph.D., North Carolina State University, 1982, M.Ed., University of North Carolina at Chapel Hill, 1972, A.B., University of North Carolina at Chapel Hill, 1971, A.A., 1969

T.H. Clay, M.D., University of North Carolina at Chapel Hill, 1979, B.S., East Carolina University, 1973

J.M. Dougherty, Ph.D., Virginia Polytechnic Institute, 1984, M.A., Radford University, 1977, M.A., Concord College, 1975

M.D. Everson, Ph.D., Stanford University, 1982, B.A., Emory University, 1971

S.L. Flagler, M.A., East Carolina University, 1973, B.A., Harpur College, 1968

T.L. Gay, M.D., University of Kentucky, 1980, B.S., University of Kentucky, 1976

D.K. Gittelman, D.O., Philadelphia College, 1983, B.S., Gannon University, 1979

T.W. Graham, M.D., University of North Carolina at Chapel Hill, 1982, M.S., University of North Carolina at Chapel Hill, 1976, A.B., Bard College, 1974

D.M. Hattem, Ph.D., University of Southern California, 1983, M.A., University of Southern California, 1981, M.A., University of California, Los Angeles, 1978

M.A. Hill, M.D., Wright State University, 1982, B.S., Purdue University, 1978

S.R. Hooper, Ph.D., University of Georgia, 1984, M.A., Western Kentucky University, 1978, M.A., Juniata College, 1976

H.J. Horacek, M.D., University of North Carolina at Chapel Hill, 1979, B.A., University of California, Berkeley, 1975 (Resigned February, 1989)

B.A. Lindsey, M.D., East Carolina University, 1984, B.S., Trevecca Nazarene College, 1980

T.E. Mates, Ph.D., University of North Carolina at Chapel Hill, 1982, B.S., St. Michael's College, 1975

T. Pawletko, Ph.D., Pennsylvania State University, M.S., Pennsylvania State University, 1985, B.S., Illinois State University, 1976

D.O. Perkins, M.D., University of Maryland, 1984, B.S., University of Maryland, 1980, B.S., University of Maryland, 1980

A.B. Short, Ph.D., University of North Carolina at Chapel Hill, 1980, A.B., Columbia University, 1973

G.B. Sibrack, M.D., Michigan State University, 1975, B.A., Kalamazoo College, 1970

M. Sved, M.D., University of North Carolina at Chapel Hill, 1979, A.B., Duke University, 1974

R.G. Swift, M.D., University of North Carolina at Chapel Hill, 1975, B.S., City College of New York, 1969

J.W. Wilkins, Ph.D., University of North Carolina at Chapel Hill, 1980, B.A., University of North Carolina at Chapel Hill, 1976

CLINICAL INSTRUCTOR

T.C. Linz, Ph.D., University of Georgia, 1988, M.A., West Georgia College, 1983, M.A., West Georgia College, 1982

ADJUNCT INSTRUCTOR

J.J. Ryan, M.S.W., University of Wisconsin, 1977, B.A., Indiana University, 1973

VISITING ASSOCIATE PROFESSOR

D.H. Overstreet, Ph.D., University of California, Irvine, 1972, A.B., University of California, Berkeley, 1965

VISITING ASSISTANT PROFESSOR

J.L. Madison, Ph.D., Duke University, 1976, M.A., University of Illinois, 1971, M.A., University of Illinois, 1969

VISITING CLINICAL PROFESSOR

L.P. Stein, M.D., Bowman Gray School of Medicine, 1970, B.A., Johns Hopkins University, 1966

VISITING CLINICAL ASSISTANT PROFESSOR

T.L. Finch, Ph.D., University of North Carolina at Chapel Hill, 1988, B.A., University of North Carolina, Wilmington, 1981

The Department of Radiation Oncology

The Department of Radiation Oncology is involved in the management of patients with cancer utilizing radiation as the primary treatment modality. We are heavily involved with the interdisciplinary care of the cancer patient and interact with multiple other medical specialties to achieve that goal. The department is involved in numerous research activities in the clinical, physics and laboratory areas. Studies have included treatment with multiple radiation treatments per day, sophisticated treatment planning approaches utilizing a department based CT scanner, and state-of-the-art 3-D display techniques. The laboratory effort is designed to obtain a better understanding of the mechanisms of radiation injury and ways to modify radiation response, and to integrate the basic science knowledge into clinical applications.

DEPARTMENT CHAIR

Joel E. Tepper, M.D., Washington University, 1972

PROFESSOR

E.L. Chaney, Ph.D., University of Tennessee, Knoxville, 1969, B.S., Millsaps College, 1965

J.E. Tepper, M.D., Washington University, 1972, B.S., Massachusetts Institute of Technology, 1968

ASSOCIATE PROFESSOR

J.G. Rosenman, M.D., University of Texas, Dallas, 1977, Ph.D., University of Texas, Austin, 1971, MS, University of Illinois, 1968, B.S., Kent State University, 1966

M. Varia, M.D., University of Liverpool, 1967, C.E.R., University of Cambridge, 1962

ASSISTANT PROFESSOR

S.L. Sailer, M.D., Harvard University, 1984, B.A., St. Olaf College, 1980

E.M. Zeman, Ph.D., Colorado State University, 1985, B.A., Brown University 1978

RESEARCH ASSISTANT PROFESSOR

M.S. Levoy, Ph.D., University of North Carolina at Chapel Hill, 1989, M.S., Cornell University, 1978, B.A., Cornell University, 1976

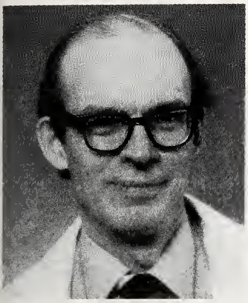
CLINICAL ASSISTANT PROFESSOR

J.D. Bourland, Ph.D., University of North Carolina at Chapel Hill, M.S.P.H., University of North Carolina at Chapel Hill, 1981, B.S., University of North Carolina at Chapel Hill, 1978

P.T. Edkins, M.D., University of North Carolina at Chapel Hill, 1980, B.S., University of Mississippi, 1972

VISITING ASSOCIATE PROFESSOR

J.A. Raleigh, Ph.D., Massachusetts Institute of Technology, 1967, M.S., University of British Columbia, 1962



The Department of Radiology

The Department of Radiology is primarily engaged in the radiologic care of patients. Conventional x-ray techniques are blended with the newer imaging modalities of computerized tomography, ultrasound, and nuclear medicine for the best possible assessment of pathologic processes. Basic and clinical research is being carried forward, particularly in imaging, including studies in nuclear magnetic resonance, to maximize diagnostic information.

DEPARTMENT CHAIR

James H. Scatliff, M.D., Northwestern University, 1952

PROFESSOR

R.L. Clark, M.D., John Hopkins University, 1966, A.B., Oberlin College, 1962

D.J. Delany, M.D., Cambridge University, 1963, M.A., Cambridge University, 1961 (Resigned November, 1989)

F.A. DiBianca, Ph.D., Carnegie-Mellon University, 1970, M.S., Carnegie-Mellon University, 1966, B.S., Rensselaer Polytechnic Institute, 1962 (Resigned September, 1989)

P.F. Jaques, M.D., Middlesex Hospital/Medical School, England, 1970, B.S., University College, London, 1961

R.E. Johnston, Ph.D., Vanderbilt University, 1968, M.S., Vanderbilt University, 1958, B.S., University of Akron, 1956

W.H. McCartney, M.D., Northwestern University, 1969, B.S., Northwestern University, 1967

D.F. Merten, M.D., University of Cincinnati, 1956, B.S., University of Cincinnati, 1952

C.E. Mittelstaedt, M.D., University of Arkansas, 1971, B.S., University of Arkansas, 1969

J.H. Scatliff, M.D., Northwestern University, 1952, B.S., Northwestern University, 1949

ASSOCIATE PROFESSOR

L. Kwock, Ph.D., University of California, Santa Barbara, 1974, M.S., San Diego State College, 1968, B.S., San Jose State College, 1965

M.A. Mauro, M.D., Cornell University, 1977, B.S., Cornell University, 1973

J.R. Perry, M.D., University of Tennessee, 1967, B.S., University of Tennessee, 1966

B.M. Tsui, Ph.D., University of Chicago, 1977, A.M., Dartmouth College, 1972, B.Sc., Chung Chi College, 1970

R.A. Whaley, M.D., Medical College of Wisconsin, 1958, M.S., Medical College of Wisconsin, 1957, B.S., Marquette University, 1953

ASSISTANT PROFESSOR

J.K. Adams, M.D., University of North Carolina at Chapel Hill, 1976, B.S., Duke University, 1972

I.E. Bell, M.D., University of North Carolina at Chapel Hill, 1982, M.Ed., University of North Carolina at Chapel Hill, 1974, B.A., University of North Carolina at Chapel Hill, 1972 (Resigned July, 1989)

B.M. Carpenter, M.D., University of Minnesota, 1980, B.A., Luther College, 1975

B. . Keefe, M.D., Columbia College, 1981, B.A., St. John's College, 1976

M.A. Koomen, M.D., University of North Carolina at Chapel Hill, 1984, B.A., North Carolina State University, 1982

L.A. Parker, Jr., M.D., University of North Carolina at Chapel Hill, 1980, B.S., U.S. Naval Academy, 1966

E.D. Pisano, M.D., Duke University, 1983, A.B., Dartmouth College, 1979

J.B. Renner, M.D., University of Virginia, 1980, B.A., University of Virginia, 1977

M.L. Schiebler, M.D., University of Florida, 1982, B.S., University of Florida, 1978

B.C. Yankaskas, Ph.D., University of North Carolina at Chapel Hill, 1982, M.P.H., Yale University, 1973, B.A., Simmons College, 1967 (Resigned May, 1989)

INSTRUCTOR

L.L. Moyle, M.A., Medical University of South Carolina, 1984, B.S., University of North Carolina at Chapel Hill, 1979

D.L. Wright, M.S., North Carolina State University, 1988, B.S., University of North Carolina at Chapel Hill, 1980

LECTURER

P. Gratale, B.S., University of North Carolina at Chapel Hill, 1983

RESEARCH ASSISTANT PROFESSOR

D.V. Beard, Ph.D., University of Michigan, 1985, M.S., University of Michigan, 1981, M.S., Hope College, 1978

A.P. Joseph, Ph.D., Wesleyan University, 1985, B.A., Central Connecticut State University, 1979

V. Klymenko, Ph.D., State University of New York, Athens, 1984, B.A., University of Rhode Island, 1974

CLINICAL PROFESSOR

R. McLelland, M.D., University of Cincinnati, 1948

CLINICAL ASSOCIATE PROFESSOR

M.D. Parker, M.D., Duke University, 1968, B.S., Florida State University, 1964

CLINICAL ASSISTANT PROFESSOR

W.E. Drobnes, M.D., Faculte Medicine Tours, France, 1976, B.A., Lafayette College, 1966

J.S. Halle, M.D., Tufts University, 1975, B.A., Barnard College, 1971

K. Heater, M.D., University of Cincinnati, 1982, B.S., University of Cincinnati, 1978

R.I. Suberman, M.D., University of North Carolina at Chapel Hill, 1970, B.S., University of North Carolina at Chapel Hill, 1965

D.M. Warshauer, M.D., University of North Carolina at Chapel Hill, 1978, B.S., Yale University, 1974

C.B. Wilcox, M.D., University of Michigan, Ann Arbor, 1973, B.S., University of Michigan, Ann Arbor, 1968

CLINICAL INSTRUCTOR

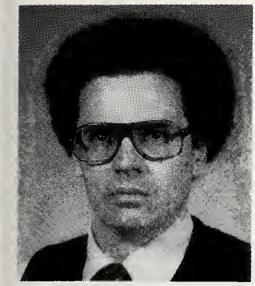
J.J. Alcini, M.D., Wayne State University, 1967, B.S., Wayne State University, 1963

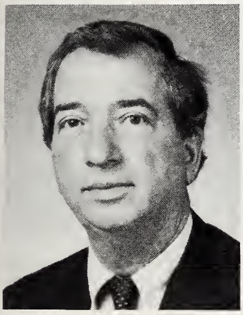
VISITING RESEARCH ASSOCIATE PROFESSOR

X.D. Zhao, Tsinghua University, 1964

VISITING RESEARCH ASSISTANT PROFESSOR

B. Gong, Peking University, 1980, B.S., Peking University, 1970





The Department of Social Medicine

Illness and healing take place in a socio-cultural context that embraces the complexity of the human world, including social values, historical legacy and changing social, economic and political forces. The Department of Social Medicine is concerned with this larger social dimension of medicine and pursues its work with three purposes in mind: 1) to articulate that body of social science, humanities and public health knowledge most appropriate to medical education; 2) to incorporate that knowledge with its methods and perspectives into the preclinical, clinical and post-graduate training; and 3) to develop research and service activities consistent with a scholarly interest in that body of knowledge. The Department carries out its work through programs of teaching, research and public service, and relies on a multidisciplinary faculty and an interdisciplinary approach. Represented on the Department's faculty are specialists in clinical mediedicine, public health, public policy, medical administration, philosophy and ethics, history, literature, anthropology, sociology, epidemiology, political science, economics and law.

DEPARTMENT CHAIR

Larry R. Churchill, Ph.D., Duke University, 1973 (appointed 6/1/88)

I.G. Wilson, M.A., University of Oklahoma, 1952 (resigned as Chair 5/31/88)

PROFESSOR

L.R. Churchill, Ph.D., Duke University, 1973, M.A., Duke University Divinity School, 1970, M.A., Southwestern University, 1967

G.H. DeFriese, (Co-Director, The Robert Wood Johnson Clinical Scholars Program) (Director, Health Sciences Research Center) Ph.D., University of Kentucky, 1967, M.A., University of Kentucky, 1966, B.S., Middle Tennessee State University, 1963

C.C. Fordham III, M.D., Harvard University, 1951

A.J. Hoole, M.D., Medical College of South Carolina, 1964, B.A., University of the South, 1960

D.L. Madison, M.D., Loma Linda University, 1965, B.S., Lasierra College, 1958

J.C. Pickard, M.D., University of North Carolina at Chapel Hill, 1962, B.A., University of North Carolina at Chapel Hill, 1958

C. Shy, Ph.D., University of Michigan, 1967, M.P.H., 1965, M.D., Marquette University, 1962, A.B., St. Louis University, 1956

R.P. Strauss, Ph.D., University of Pennsylvania, 1979, D.M.D., University of Pennsylvania, 1972, M.A., University of Pennsylvania, 1973, B.A., Queens College, 1968

I.G. Wilson, M.A., University of Oklahoma, 1952, B.A., University of Oklahoma, 1950

ASSOCIATE PROFESSOR

A.M. Brandt, Ph.D., Columbia University, 1983, M.A., Columbia University, 1978, M.A., Brandeis University, 1974

A.W. Cross, M.D., Columbia College, 1970, B.A., Yale University New Haven, 1966

S.E. Estroff, Ph.D., University of Wisconsin, Madison, 1978, M.A., University of Wisconsin, Madison, 1975, M.A., Duke University, 1972

J.P. Morrissey, Ph.D., University of North Carolina at Chapel Hill, 1975, M.A., Clark University, 1966, M.A., College of the Holy Cross, 1963

D.K. Runyan, M.D., University of Minnesota, Minneapolis-St. Paul, 1976, Ph.D., University of North Carolina at Chapel Hill, 1983, M.P.H., University of Minnesota, 1975, A.B., Macalester College, 1972

ASSISTANT PROFESSOR

L.S. Campbell, M.H.A., Medical College of Virginia, 1962, B.S., University of North Carolina at Chapel Hill, 1960

T.S. Carey, M.D., University of Vermont, 1976, M.P.H., University of North Carolina at Chapel Hill, 1985, B.A., Colby College, 1972

G.E. Henderson, Ph.D., University of Michigan, 1982, M.A., University of Michigan, 1977, M.A., Oberlin College, 1971

N.M.P. King, J.D., University of North Carolina at Chapel Hill, 1980, B.A., St. John's College, 1975

INSTRUCTOR

R. Riportella-Muller, Ph.D., University of Wisconsin, 1985, M.S., University of Wisconsin, 1979, M.S., State University of New York, Binghamton, 1976

LECTURER

V.G. Nichols, Ph.D., Duke University, M.D., Medical University of South Carolina, 1984, B.A., Duke University, 1975 (Resigned May, 1989)

A.F. Stanford, Ph.D., University of North Carolina at Chapel Hill, 1989, M.A., University of North Carolina at Chapel Hill, 1985, M.A., Hollins College, 1983

RESEARCH ASSISTANT PROFESSOR

S.E. Landis, M.D., University of Pennsylvania, 1978, M.P.H., University of North Carolina at Chapel Hill, 1986, B.S., Muhlenburg College, 1974

C.W. Runyan, Ph.D., University of North Carolina at Chapel Hill, 1983, M.P.H., University of Minnesota, 1975, B.A., Macalester College, 1972

RESEARCH INSTRUCTOR

W.M. Hunter, M.P.H., University of North Carolina at Chapel Hill, 1981, B.A., University of North Carolina at Chapel Hill, 1971

L.C. Illingworth, Ph.D., University of Florida, 1983, M.A., University of Florida, 1977, M.A., Florida Atlantic University, 1972

A.M. Jackman, M.S., University of North Carolina at Chapel Hill, 1974, B.A., University of North Carolina at Chapel Hill, 1971

ADJUNCT PROFESSOR

W.D. Fullerton, B.A., University of Rochester, 1951

The Department of Surgery

The Department of Surgery is composed of seven divisions, namely: Cardiothoracic, General Surgery, Neurosurgery, Orthopedic Surgery, Otolaryngology, Plastic and Reconstructive Surgery and Urology. The Division of General Surgery includes the disciplines of critical care, endocrine surgery, gastrointestinal surgery, pediatric surgery, surgical oncology, transplantation, trauma and vascular surgery. The goals of the Department are to provide exemplary clinical care in all surgical disciplines, to provide opportunities for education in surgery at the undergraduate and graduate level, to generate new knowledge by the conduction of basic science and clinical investigation, and to provide community service. Each surgical discipline attempts to achieve these goals with an underscoring of excellence. The specific programs will vary with the interest of the faculty, facilities, and current needs. Graduate educational programs are conducted in all surgical disciplines.

DEPARTMENT CHAIR

George F. Sheldon, (Zack D. Owens Distinguished Professorship of Surgery), M.D., Kansas University Medical School, 1961

PROFESSOR

C.C. Baker, M.D., Harvard University, 1974, B.A., Williams College, 1970

J.A. Bevin, M.D., Yale University, 1960, A.B., Wesleyan University, 1956

W.P. Biggers, (Joseph Palmer Riddle Professor of Surgery) M.D., University of North Carolina at Chapel Hill, 1963, B.S., Davidson College, 1959

H.R. Brashear, M.D., University of California, San Francisco, 1945, A.B., University of California, Berkeley, 1943

J.N. Coulter, M.D., Harvard University, 1950, B.S., Virginia Polytechnic Institute, 1941

R.D. Croom, III, M.D., University of North Carolina at Chapel Hill, 1964, B.S., Davidson College, 1960

N.D. Fischer, (Thomas J. Dark Distinguished Professor of Surgery) M.D., University of Texas, 1945, B.S., University of Texas, 1943, B.S., University of Texas, 1942

F.A. Fried, (Drs. John Sloan Rhodes and John Flint Rhodes Professorship of Urology and Surgery) M.D., University of Chicago, 1961, B.S., Brooklyn College, 1957

W.B. Greene, M.D., University of North Carolina at Chapel Hill, 1972, B.S., Davidson College, 1968

J.G. Johnson, (Special Assistant to the Dean) (Roscoe Bennett Gray Cowper Professor of Surgery) M.D., Cornell University, 1952, B.S., University of North Carolina at Chapel Hill, 1949

C.N. Lucas, (Acting Director, Curriculum in Biomedical Engineering and Mathematics) Ph.D., University of North Carolina at Chapel Hill, 1973, M.S., University of Arizona, 1967, M.S., Dakota Wesleyan University, 1961

S.R. Mandel, (Associate Dean and Chief of Staff, University of North Carolina Hospitals) M.D., University of Virginia, 1962, M.S., University of Virginia, 1966, M.S., Columbia College, 1962

J.G. Maxwell, M.D., University of Utah, 1958, B.S., University of Utah, 1954

H.D. Peterson, (Oliver R. Rowe Distinguished Professor of Surgery) (Chief, Burn Center) M.D., Northwestern University, 1962, D.D.S., Northwestern University, 1956

I.H. Pillsbury, (Medical Director, Carolina Consultation Center) M.D., George Washington University, 1972, B.A., George Washington University, 1970

H.J. Proctor, M.D., New York University, 1967, A.B., Princeton University, 1958 (Resigned June, 1989)

G.F. Sheldon, (Dr. Zack D. Owens Distinguished Professor of Surgery) M.D., Kansas University, 1961, B.A., University of Kansas, 1957

P.J. Starek, M.D., Ohio State University, 1964, B.A., College of Wooster, 1959

T.N. Taft, (Max Novich, M.D., Associate Professor of Sports Medicine and Surgery) M.D., University of Missouri, 1969, A.B., Princeton University, 1964

C.G. Thomas, (Mr. and Mrs. Sanford Doxey, Jr. Distinguished Professor of Surgery) M.D., University of Chicago, 1943, B.S., University of Chicago, 1940

B.R. Wilcox, M.D., University of North Carolina at Chapel Hill School of Medicine, 1957, B.A., University of North Carolina at Chapel Hill, 1953

J.F. Wilson, M.D., Medical College of Georgia, 1954, A.B., Vanderbilt University, 1950

ASSOCIATE PROFESSOR

A.J. Banes, Ph.D., Virginia Commonwealth University, 1974, M.S., University of Richmond, 1971, M.S., Lehigh University, 1969

S.J. Burnham, M.D., Vanderbilt University, 1972, B.A., Vanderbilt University, 1969

L.E. Dahners, M.D., University of Arizona, 1978, B.S., University of Arizona, 1975

R.M. Dalston, Ph.D., Northwestern University, 1972, M.A., Northwestern University, 1966, M.A., Cornell University, 1964

T.L. Fry, M.D., University of North Carolina at Chapel Hill, 1973, B.A., University of North Carolina, Greensboro, 1969 (Resigned July, 1989)

I.J. Hall, Ph.D., University of North Carolina at Chapel Hill, 1976, M.S., University of North Carolina at Chapel Hill, 1980, B.S., College of William and Mary, 1972

A.R. Hansen, M.D., University of Iowa, 1977, Ph.D., University of Iowa, 1970, M.S., University of Iowa, 1968, B.S., Michigan Technological University, 1965

J.C. Herbst, M.D., University of Mississippi, 1967, M.S., University of Mississippi, 1972, B.S., Mississippi College, 1963

H.S. Hsiao, Ph.D., University of California, Berkeley, 1972, M.S., Massachusetts Institute of Technology, 1967, B.S., Massachusetts Institute of Technology, 1965

J.F. Huth, M.D., University of Rochester, 1975, B.S., Marquette University, 1971

B.A. Keagy, M.D., University of Pittsburgh, 1970, B.A., Duke University, 1966

A.A. Meyer, M.D., University of Chicago, 1977, Ph.D., University of Chicago, 1976, B.A., University of Minnesota, 1970

D.W. Oller, M.D., George Washington University, 1969, A.B., Franklin and Marshall College, 1964

S.K. Powers, M.D., Ohio State University, 1977, B.S., Ohio State University, 1974

W.W. Shockley, M.D., Indiana University, 1976, B.A., Indiana University, 1972

ASSISTANT PROFESSOR

L.C. Almekinders, M.D., Erasmus University, 1982

R.G. Azizkhan, M.D., Pennsylvania State University, 1975, B.S., Dickinson College, 1972

D.K. Bynum, M.D., University of Texas, 1976, B.S., Baylor University, 1973

T.V. Clancy, M.D., University of The East, Quezon, 1979, B.A., Creighton University, 1972

J.U. Davis, M.D., Duke University, 1980, D.D.S., University of North Carolina at Chapel Hill, 1977, B.S., Wake Forest University, 1973

A.F. Drake, M.D., University of North Carolina at Chapel Hill, 1981, B.A., Cornell University, 1977

T.M. Egan, M.D., University of Toronto, 1976, M.S., University of Toronto, 1984

R.S. French, M.D., University of Arizona, 1981, B.A., University of California, 1977 (Resigned October, 1989)

J.A. Gilbert, Ph.D., Duke University, 1982, B.S., Mississippi State University, 1977 (Resigned November, 1988)

J.H. Grose, Ph.D., Northwestern University 1987, M.S., University of Southhampton, 1981, M.S., University of Keele, England, 1979

R.C. Henderson, M.D., University of Chicago, 1980, Ph.D., University of Chicago, 1978, B.S., University of Illinois, 1973

M.J. Koruda, M.D., Yale University, 1981, B.S., Boston College, 1977

S.R. Lacey, M.D., University of New Mexico, 1980, B.S., Eastern New Mexico University, 1976

P.F. Lachiewicz, M.D., Cornell University, 1977, A.B., Manhattan College, 1973

W.T. Lawrence, M.D., University of Virginia, 1976, M.P.H., Harvard University, 1976, B.S., Yale University, 1972

G.E. Lester, Ph.D., Medical College of Virginia, 1977, B.A., Mary Baldwin College, 1969

H. Mesrobian, M.D., American University of Beirut, 1978, B.S., American University of Beirut, 1973

M. Mill, M.D., University of Colorado, 1980, B.A., Colorado College, 1976

C.B. Minor, Jr., M.D., Tulane University, 1983, B.S., Louisiana State University, 1979

J.L. Mohler, M.D., Medical College of Georgia, 1980, A.B., Duke University, 1975

R. Rutledge, M.D., University of Florida, Gainesville, 1978, B.S., University of Florida, Gainesville, 1975

P.B. Suh, M.D., University of North Carolina at Chapel Hill, 1983, B.A., University of North Carolina at Chapel Hill, 1979

M.S. Tucker, M.D., University of Texas, San Antonio, 1977, B.A., University of Texas, Austin, 1973

D.G. Vollmer, M.D., University of Texas, 1979, B.A., Vanderbilt University, 1973 (Resigned December, 1989)

B.B. Walters, M.D., Harvard University, 1979, Ph.D., University College, England, 1976, A.B., Harvard University, 1973

S.L. Watts, Ph.D., Duke University, 1978, B.S., Duke University, 1974

M.C. Weissler, M.D., Boston University, 1980, B.A., Boston University, 1980

LECTURER

J.S. Hutcheson, Jr., B.S.E., North Carolina State University, 1964

RESEARCH PROFESSOR

M.M. Henson, Ph.D., Yale University, 1967, M.A., Smith College, 1959, M.A., Park College, 1957

J. Prazma, M.D., Charles University, Czechoslovakia, 1960

RESEARCH ASSISTANT PROFESSOR

J.W. Beckman, Ph.D., University of Michigan, 1979, M.S., University of Michigan, 1975, M.S., Trinity College, 1973, B.A., Western Michigan University, 1968 (Resigned November, 1989)

E. Bullitt, M.D., University of Colorado, 1975, B.A., Radcliffe College, 1971

B. Johnstone, Ph.D., University of London, 1987, B.Sc., Brunel University, 1983

CLINICAL PROFESSOR

B. Caterson, Ph.D., Monash University, 1975, B.S., Monash University, 1970

J.M. Van Buren, M.D., Columbia University, 1947, Ph.D., George Washington University, 1961, M.S.C., McGill University, 1950, A.B., Dartmouth College, 1943

CLINICAL ASSOCIATE PROFESSOR

H.B. Broder, Ph.D., Duke University, 1980, M.Ed., Duke University, 1977, B.A., George Washington University, 1970

S.J. Martinkosky, Ph.D., Ohio State University, 1975, M.A., Western Michigan University 1967, B.S., Ohio University, 1966

CLINICAL ASSISTANT PROFESSOR

I.J. Browder, M.D., University of North Carolina at Chapel Hill, 1970, M.A., Fordham University, 1966, A.B., University of North Carolina at Chapel Hill, 1962 (Resigned May, 1989)

J.J. Fry, M.D., University of North Carolina at Chapel Hill, 1981, B.A., Pfeiffer College, 1970 (Resigned February, 1989)

J.E. Manning, M.D., University of North Carolina at Chapel Hill, 1985, B.A., University of North Carolina at Chapel Hill, 1981

VISITING PROFESSOR

J.R. Dacey, M.D., University of Virginia, 1974, B.A., Harvard University, 1970 (Resigned November, 1989)

Curriculum in Biomedical Engineering and Mathematics

Biomedical Engineering and Mathematics is a new field stressing the application of engineering techniques, mathematical analysis, and biomedical computing to medical problems. This curriculum offers graduate education in the field leading to the Master of Science and Doctor of Philosophy degrees. Arrangements may be made for qualified medical students to work for a joint M.D./Ph.D. degree under this program.

Students enter this program with a wide variety of backgrounds in engineering, physical science, mathematics, or biological science. Curricula are tailored to fit the needs and develop the potentials of individual students. All students select courses from the core curriculum (described below). In addition, courses in biostatistics, computer science, physiology, and mathematics or engineering provide a well rounded background of knowledge and skills.

The program is distinctive in that it is one of the few in this field that is physically and administratively situated in a medical school. This has the advantage of placing students in close contact with a medical staff, clinical problems, and ongoing medical research, providing many unique opportunities to apply their talents in a project oriented atmosphere. The Alexander F. Fortune Biomedical Computation Center and other computing facilities are also available. Graduates of this program are well qualified to apply engineering, mathematics, and biomedical computing in hospitals, clinics, private research laboratories, government laboratories, and other institutions involved in health care delivery.

PROFESSOR

C. L. Lucas (Vice Curriculum Director until 12/31/89 and Acting Curriculum Director as of 1/1/90) (Surgery)

R. N. Johnson (resigned as Curriculum Director 12/31/89) (Neurology)

S. M. Pizer (Computer Science)

RESEARCH PROFESSOR

H. T. Nagle, Jr., Professor—North Carolina State University

VISITING PROFESSOR

Xi De Zhao (Tsinghua University, PRC)

ASSOCIATE PROFESSOR

H. S. Hsiao (Surgery) (Director, Graduate Studies)

RESEARCH ASSOCIATE PROFESSOR

J. D. Charlton (Biomedical Engineering)
D. W. Hilsop (U.S. Army Research Office, RTP)
R. H. Propst (Biomedical Engineering)
B. M. W. Tsui (Radiology)

ASSISTANT PROFESSOR

J. W. Buchanan, Jr. (Medicine)
S. R. Quint (Neurology)

CURRICULUM

Courses for Graduates and Advanced Undergraduates

** indicates core curriculum*

*100. INTRODUCTION TO BIOMEDICAL ENGINEERING (1). Introduction to biomedical engineering research, including literature search, faculty presentation of ongoing research, and student discussion of research papers. Fall. Staff.

102. BIOMECHANICS (3). Prerequisites: Physics 26, BMME 120 and Math 128 or equivalent, and permission of the instructor. Fundamental principles of solid and fluid mechanics applied to biological systems. Human gait analysis, joint replacement, testing techniques for biological structures, and viscoelastic models are presented. Papers from the current biomechanics literature will be discussed. Fall.

103. BIOELECTRIC PHENOMENA (3). Prerequisites: Physics 27, BMME 111, BMME 120 and BMME 131 or equivalent, and permission of instructor. Fundamental principles of electromagnetism, biologically exemplified, are presented. Circuit models and volume conductor theory are applied at all biological levels. Minicomputer simulations are used to demonstrate bioelectric properties. Fall. Buchanan.

106. NETWORK TRANSFORM METHODS (3). Prerequisites: Physics 101 and permission of the instructor. Analysis of linear systems by transform methods to networks, including stability analysis. Survey of numerical methods for network solutions. Spring. Propst.

107. ACTIVE NETWORK ANALYSIS (3). Prerequisites: Physics 101 and permission of instructor. Physics and network models of active devices. Active filter design and applications to communicate systems, including information theory. Fall. Propst.

*111. BIOMEDICAL INSTRUMENTATION I (3). Prerequisites: Physics 101 or equivalent, Physics 102 corequisite and permission of instructor. Topics include analysis of medical instrumentation with emphasis on pressure, flow, bioelectric, and ultrasonic transducers. This course includes a laboratory and the interfacing of microprocessors with transducers. Students are given the opportunity to design and fabricate original devices. Spring. Hsiao, Buchanan.

112. BIOMATERIALS (3). Prerequisite: Physiology 140 or equivalent. Chemical, physical, engineering and biocompatibility aspects of materials, devices or systems for implantation in, or interfacing with, the body, cells or tissues. Food and Drug Administration and legal aspects. Fall. Hanker, Kusy, staff.

*120. REAL-TIME COMPUTER APPLICATIONS I (3). Prerequisite: Computer Science 14 or equivalent. Introduction to digital computers for on-line, real-time processing of biomedical signals. Assembly language programming is stressed with applications ranging from control of peripheral devices to interfaces with higher level languages. Fall. Charlton.

121. DIGITAL SIGNAL PROCESSING I (3). Prerequisite: Computer Science 14 or equivalent. This is an introduction to methods of automatic computation of special relevance to biomedical problems. Sampling theory, analog-to-digital conversion, digital filtering, will be explored in depth. Spring. Lucas.

123. NUMERICAL METHODS (2). Prerequisite: Math 34. Theory and applications numerical differentiation and integration equations, multiparameter minimization, Monte Carlo methods. Oriented towards computer solutions of engineering problems. Fall. Tsui.

128. ANALYSIS OF DIGITAL SYSTEMS (3). Prerequisites: Physics 101 and 102, and permission of instructor. Application of Boolean algebra to the analysis and synthesis of switching circuits; techniques of minimizing Boolean functions; number systems; arithmetic operations; threshold logic; asynchronous machines. Fall. Quint.

*132. LINEAR CONTROL THEORY (3). Prerequisite: Math 128 or equivalent. Linear control system analysis and design are presented. Frequency and time domain characteristics and stability are studied. Fall. Charlton.

141. MEDICAL IMAGING I (3). Prerequisites: Math 34, Physics 28. Basic physics of x-radiation, gamma radiation, nuclear magnetic resonance, and ultrasound are applied to medical imaging problems. Digital electronics, radiation, interaction and detection, image analysis and counting statistics are treated. Fall. Tsui.

142. MEDICAL IMAGING II (3). Prerequisite: BMME 141. Modern medical diagnostic imaging techniques and instrumentation are studied, including classical and digital radiography, computed tomography, nuclear medicine, magnetic resonance, and ultrasound, including discussion of clinical utility. Spring. Tsui.

160. BMME (3). The structure, defects, thermodynamics, kinetics, and properties (mechanical, electrical, thermal and magnetic) of matter (metals, ceramics, polymers and composites) will be considered. Fall. Kusy.

Courses for Graduates

201. BIOMEDICAL INSTRUMENTATION II (3). Prerequisite: BMME 111, or permission of instructor. The fundamentals of microprocessor theory and practical circuit design are presented in the context of biological applications. This course includes a laboratory and individual student projects. Fall. Hsiao.

204. SOLID STATE DEVICES; THEORY AND FABRICATION (3). Prerequisite: Permission of instructor. Properties of solid state materials and devices. Technology for thick and thin film deposition and impurity injection. Design and fabrication of hybrid circuits. Interconnection of devices, packaging and testing. Fall. Propst.

212. BMME (2). Prerequisite: BMME 112 or permission of instructor. Materials properties promoting cell and tissue adherence rather than microbial infection. Wound healing, biomaterials incorporation and mechanisms of implant failure or carcinogenicity will be discussed. Spring. Hanker

213. BMME (2). Implantable electrodes or devices for biosensing, drug delivery, cyta- or plasmapheresis or neural regulation including pain control. The controlled organization and metallization of biomacro-molecules for molecular electronic semiconductor devices. Fall. Hanker

220. REAL-TIME COMPUTER APPLICATIONS II (3). Prerequisites: BMME 120, Physics 102. Problems of interfacing minicomputers with biomedical devices and systems are studied, with projects including process control, data acquisition, disk system interfaces, and serial, parallel and DMA interfaces between interconnected minicomputers. Spring. Charlton.

221. NEURAL INFORMATION PROCESSING (3). Prerequisites: Math 128, Physiology 140, BMME 103 or equivalent. This course approaches the nervous system as a data processing network, the brain as the computer for a homeostat. Spring. Quint.

222. HEMODYNAMICS (3). Prerequisites: BMME 102 and Physiology 140 or equivalents. The dynamics of blood flow in blood vessels is studied from the standpoint of modern continuum mechanics. Mathematical models of cardiac action and cardiovascular regulation are included. Lucas.

223. DIGITAL SIGNAL PROCESSING II (3). Prerequisites: BMME 121, Math 128, and BMME 132 or equivalent. Advanced techniques for analyzing biomedical systems and signals are presented, including signal characterization, pattern recognition, and parameter estimation. Examples from biomedical literature are studied. Spring. Quint.

231. SPECIAL TOPICS (Hours to be arranged). Prerequisite: Permission of the instructor. Special library and/or laboratory work on an individual basis on specific problems in biomedical engineering and biomedical mathematics. Direction of students will be on a tutorial basis, and subject matter will be selected on the basis of individual needs. Fall and spring. Staff.

232. DIGITAL CONTROL THEORY (3). Prerequisite: BMME 132 or equivalent. Discrete time systems performance and stability are represented in the time and frequency domains. Series compensation and state variable design techniques are studied. Student projects employ analog and digital computers to perform discrete time control designs and simulations. Fall. Quint, Charlton.

233. BIOMATHEMATICAL MODELING (3). Prerequisites: Math 124, 128 or equivalent. Mathematical modeling and computer simulation of physiological and other biomedical systems, with emphasis on application of ordinary and partial differential equations. Analytical and digital solution techniques are considered. Fall. Lucas.

234. OPTIMAL CONTROL THEORY (3). Prerequisite: BMME 132 or equivalent. Linear and Nonlinear system representation using state-space are studied. Other techniques include: Pole placement using state variable feedback, phase plane analysis, calculus of variations, the Hamilton-Jacobi approach, Kalman filters and discrete time representation. Students work on projects employing digital computer simulations and computer based design tools. Spring. Charlton.

235. FINITE ELEMENT ANALYSIS (3). Prerequisites: BMME 102 or equivalent, and permission of instructor. The underlying principles associated with the finite element method will be presented along with applications. Topics to be included are the development of the stiffness matrix, node numbering schemes, potential energy and the Rayleigh-Ritz method, and element selection. Spring. Lucas.

251. DIGITAL X-RAY IMAGING (3). Prerequisites: BMME 141, 142. Advanced topics of physics and instrumentation in digital x-ray imaging technique are treated with emphasis on digital radiography and computed tomography. Fall. Tsui.

252. DIGITAL NUCLEAR IMAGING (3). Prerequisites: BMME 141, 142. Advanced topics of physics and instrumentation in nuclear imaging and magnetic resonance techniques. Spring. Tsui.

253. ADVANCED MEDICAL IMAGE PROCESSING (3). Prerequisite: BMME 141, 142. Theory and digital implementation of image processing and reconstruction techniques applied in medical imaging are discussed. Specific topics include filtering, edge detection and image reconstruction algorithms. Fall (alternate years). Tsui.

259. PICTURE PROCESSING AND PATTERN RECOGNITION (COMP 254) (3). Prerequisites: Probability, Linear Algebra, Math 34, Comp 14. Theory and practice of picture coding, picture improvement, picture analysis and pattern recognition as applied to pictures. Pizer, Tsui.

260. BMME (3). Prerequisite BMME 160 or permission of instructor. Within a laboratory environment the fundamental or engineering properties of various biomaterial will be evaluated. Scientific methodology, data analysis and technical report writing will be stressed. Fall and spring. Kusy.

280. ROBOTICS (3). Prerequisites: BMME 120, 132 or equivalent. Basic concepts and methods of robot programming, artificial intelligence, machine vision, hierarchical control, and sensory hierarchies, with applications to medical prosthesis and automation of clinical laboratories. Charlton.

311. RESEARCH IN BIOMEDICAL ENGINEERING AND BIOMATHEMATICS (Hours to be arranged). Prerequisite: permission of the instructor. Staff.

393. MASTER'S THESIS (Hours to be arranged). Staff.

394. DOCTORAL DISSERTATION (Hours to be arranged). Staff.

400. GENERAL REGISTRATION (0).

Curriculum in Genetics

Genetics is one of the most rapidly developing fields of modern biology, and is basic to the understanding of many aspects not only of biology but also of medicine and the future of man. The Curriculum in Genetics was established to provide an integrated and interacting interdepartmental program of study leading to the Ph.D. degree in genetics. The courses open to the students are primarily those of the departments of Biochemistry, Biology, Chemistry, Microbiology and Immunology, Pathology and Pharmacology. The facilities as well as the talent of those and several clinical departments are available to students in the Curriculum in Genetics. Types of research being conducted by faculty members of the Curriculum include bacterial and viral genetics, microbial genetics, mutagenesis, immunogenetics, human and medical genetics, biochemical genetics, tissue culture, chromatin structure, behavioral genetics, anthropological genetics, developmental genetics, statistical and population genetics, Drosophila genetics, Neurospora cytogenetics, cell biology, and molecular biology. (Although there is a research program in medical genetics, there is not a professional program in genetic counseling or medical genetics.)

Requirements for Admission to Graduate Work

Applications will be favorably considered from students with good academic records and interest in careers in genetics research. They should preferably have majored or minored in one of the following disciplines: genetics, biology (zoology or botany), chemistry, microbiology, physics, mathematics, or biophysics. They should have taken calculus and organic and physical chemistry, although these are not absolutely essential. Applicants are accepted to begin their initial studies in the fall. They must apply to both the Graduate School and the Curriculum in Genetics. Graduate Record Examination scores, transcripts of records, and three letters of recommendation (submitted in the Graduate School official form) should be received soon after the application. Those persons whose application portfolio places them highest on the admission list will be asked to visit Chapel Hill for interviews at their expense. Students are encouraged to apply as early as possible, preferably before January. Master's candidates are not accepted.

Requirements for the Ph.D. Degree

Students may receive the Ph.D. degree either in genetics or in one of the departments participating in the curriculum. No minor is required for those majoring in genetics. The requirements concerning a minor for those majoring in a department vary among the participating departments. Graduate students are expected to master one subdiscipline of genetics, but to be sufficiently versed in related aspects of that science. Students work under a research advisor of their choosing, assisted by other faculty members in closely allied branches of genetics.

Financial Aid

A limited number of NIH predoctoral fellowships are available. The fellowships carry stipends plus tuition and fees.

Colloquia/Mini-Symposia

This format provides a forum for persons interested in all phases of genetics. The colloquia are presented on Friday during the academic year by faculty, students, and invited speakers from other institutions.

PROFESSOR

K. F. Bott (Curriculum Director) (Microbiology)
E. G. Barry (Biology)
P. J. Bassford (Microbiology)
F. J. deSerres (Adjunct, Pathology)
J. W. Drake (Adjunct, Pathology)
M. H. Edgell (Microbiology)
J. A. Frelinger (Microbiology)
J. B. Graham (Pathology)
J. Griffith (Microbiology)
G. Haughton (Microbiology)
E. S. Huang (Medicine, Microbiology)
C. A. Hutchison III (Microbiology)
B. H. Judd (Adjunct, Biology)
J. C. Lucchesi (Biology)
T. D. Petes (Biology)
A. Sancar (Biochemistry)
O. Smithies (Pathology)
P. F. Sparling (Medicine, Microbiology)
D. W. Stafford (Biology)
M. R. Swift (Medicine)

ASSOCIATE PROFESSOR

S. L. Bachenheimer (Microbiology)
J. C. Barrett (Adjunct, Pathology)
K. S. Bloom (Biology)
J. G. Cannon (Microbiology)
C. J. Edgell (Pathology)
B. J. Errede (Chemistry)
R. A. Farber (Pathology)
D. M. Fowlkes (Pathology)
H. M. Fried (Biochemistry)
R. Kole (Pharmacology)
S. T. Lord (Pathology)
N. Maeda (Pathology)
P. F. Maness (Biochemistry)
G. P. Maroni (Biology)
S. W. Matson (Biology)

A. G. Matthysse (Biology)
J. E. Newbold (Microbiology)
P. J. Pukkila (Biology)
H. M. Reisner (Pathology, Microbiology)
M. A. Resnick (Adjunct, Pathology)
R. I. Swanstrom (Biochemistry)
M. D. Topal (Pathology, Biochemistry)
B. E. Weissman (Pathology)

ASSISTANT PROFESSOR

J. C. Azizkhan (Pharmacology)
V. L. Bauteh (Biology)
P. A. Bedinger (Biology)
K. A. High (Medicine, Pathology)
L. J. Kalfayan (Biochemistry)
W. K. Kaufmann (Pathology)
B. K. Kay (Biology)
E. T-B. Liu (Medicine)
K. W. Rao (Pathology)
R. G. Rohwer (Microbiology)
G. B. Sancar (Biochemistry)
L. L. Searles (Biology)
T. D. Tlsty (Pathology)
J. M. H. Vos (Biochemistry)

CURRICULUM

Courses Offered for Graduate Students

105. MOLECULAR BIOLOGY (Biochemistry 105) (3). Prerequisite: Biochemistry 100 or equivalent. Mechanisms of replication, transcription, and translation of genetic material in procaryotic and eucaryotic systems, gene sequence and organization, biochemical genetics, and regulatory mechanisms. 3 lecture hours a week. Fall. Chae, Fried, Sancar.

106. ENZYME KINETICS (Biochemistry 106) (1). Prerequisite: Biochemistry 100 or equivalent. An analysis of enzyme-catalyzed multiple substrate reactions, the kinetic characteristics of allosteric enzymes, and methods for studying control or reaction in intact cells. Spring. Jones, White.

108. MOLECULAR AND CELLULAR BASIS OF MICROBIOLOGY (Microbiology 105). Prerequisites: Organic Chemistry, permission of department except for department majors. Basic concepts of the structure, metabolism, growth, and reproduction, genetics and control and regulation of procaryotes and single cell eucaryote systems. 4 lecture hours a week. Fall.

110. ADVANCED MOLECULAR BIOLOGY I (Biochemistry 110, Microbiology 108, Pharmacology 136, Biology 178) (3). Prerequisites for undergraduates: at least one undergraduate course in both Biochemistry and Genetics, DNA structure, function and interactions in prokaryotic and eukaryotic systems, including chromosome structure, replication, recombination, repair and genome fluidity. Three lecture hours a week. Fall. Bedinger, Griffith, Sancar.

111. ADVANCED MOLECULAR BIOLOGY II (Biochemistry 111, Microbiology 109, Pharmacology 137, Biology 179) (3). Prerequisites for undergraduates, at least one undergraduate course in both Biochemistry and Genetics, RNA structure, function and processing in biological systems including transcription, gene regulation, translation, and oncogenes. Three lecture hours a week. Spring. Kole, Fried, Searles.

112. PRINCIPLES OF GENETIC ANALYSIS (Biology 161) (3). Prerequisites: for undergraduates, Biology 53 and permission of the instructor; for graduate students, an undergraduate genetics course or permission of the instructor. Analysis of recombinant and other genetic interactions in prokaryotes, eukaryotes and viruses. Three lecture hours a week. Spring. Petes, Lucchesi, Bott.

115. GENETICS AND HUMAN EVOLUTION (Anatomy 115, Anthropology 115) (3). Fundamental principles of genetics; population genetics; factors of evolution; race and species formation; evolution of primates and man. The interaction of genetics and culture in human behavior, society, and evolution. 3 lecture hours a week. Spring. Pollitzer.

122. HUMAN GENETICS (Biology 122) (3). Prerequisite: Biology 53 or equivalent. Applications of traditional and contemporary methods of genetic analysis to matters of human concern; pedigree analysis, population genetics, tissue transplants, immunogenetics, somatic cell genetics, and recombinant DNA in medical applications. 3 lecture hours a week. Spring. Maroni.

150. ELEMENTS OF PROBABILITY AND STATISTICAL INFERENCE (Biostatistics 150) (3). Prerequisite: integral calculus. Fundamentals of probability theory; descriptive statistics; fundamentals of statistical inference, including estimation and hypothesis testing. 3 lecture hours a week. Fall and spring. Biostatistics staff.

160. ADVANCED GENETICS: DEVELOPMENTAL (Biology 160A) (3). Prerequisite: Biology 53. The genetic control and molecular basis of gene expression during development. 3 lecture hours a week. Spring (alternate years). Lucchesi, Pukkila.

164. MOLECULAR BIOLOGY (Biology 164) (3). Prerequisites: Biology 120 or 121; Chemistry 61, prerequisite or corequisite. The nature, production and replication of biological compounds and their relation to structure and function in development. 3 lecture hours a week. Spring. Stafford, Matson.

169. INTRODUCTION TO HUMAN IMMUNOGENETICS (Pathology 169) (3). Prerequisite: permission of the instructor. A seminar course to familiarize participants with genetic systems defined in humans, using immunological techniques. Includes discussion of methodology and its application to problems of interest to participants. Three lecture hours a week. Reisner.

170. MUTAGENESIS AND GENETIC TOXICOLOGY (Toxicology 170) (2). Prerequisite: course in general genetics and general biochemistry. A survey of basic mechanisms and mutagenesis, its impact on populations, mutagenicity screening systems and their deployment. 2 lecture hours a week. Spring. Toxicology staff.

172. CYTOGENETICS (Biology 172) (3). Prerequisite: Biology 53. Critical study of research papers concerned with the behavior and organization of chromosomes. 3 hours a week. Spring (alternate years). Barry.

173. PLANT GENETICS AND SPECIATION (Biology 173) (3). Prerequisite: Biology 53 or permission of the instructor. Mendelian and molecular genetics of vascular plants, with emphasis on genetic phenomena characteristic of plants and the role of heredity in plant systems. 3 lecture hours a week. Spring (alternate years). Parks, Matthysse.

180. STRUCTURE-FUNCTIONS OF DNA AS IT RELATES TO CELL PATHOLOGY (Pathology 180) (Biochemistry 180) (3). Prerequisites: Biochemistry course and permission of instructor. The basic chemistry of DNA and its associated structural and replicative proteins as it relates to mechanisms of mutagenesis and carcinogenesis. Three lecture hours a week. Spring (alternate years). Topal.

189. NUCLEIC ACID TECHNIQUES (Microbiology 189, Biology 189) (4). Prerequisites: some molecular biology, permission of instructor. An intensive course covering many aspects of recombinant DNA technology such as: cDNA preparation, gel analysis, southerns, nick translations, Berk-Sharp analysis, library analysis and DNA sequencing. Fee required. 8 laboratory hours. Spring. Molecular Biology staff.

190. EUCARYOTIC GENE ORGANIZATION (Microbiology 190) (3). Prerequisites: Organic Chemistry, permission of instructor. Basic concepts of classical chromosomal structure, function and mechanics. Eucaryotic molecular genetics and cellular regulation will be emphasized. Readings, short answer examinations, term project. 3 lecture hours. Spring. Staff.

201/202. GENETIC LECTURE SERIES (1). Diverse but current topics in all aspects of genetics. Relates new techniques and current research of notables in the field of genetics. Spring and fall. Staff and invited guest lecturers.

210. SEMINAR/TUTORIAL IN MICROBIAL CHEMISTRY AND GENETICS (Microbiology 210) (3). One or two faculty and a small number of students will consider in depth current research of importance. Emphasis will be on current literature, invited speakers, etc., rather than textbooks. 3 hours a week. Fall. Bott.

240. SPECIAL TOPICS IN GENETICS (2–4). Prerequisite: permission of the instructor. Fall. Staff.

241. SPECIAL TOPICS IN GENETICS (2–4). Prerequisite: permission of the instructor. Spring. Staff.

249. GENETICS OF COMMON DISEASES (Epidemiology 249) (3). Prerequisites: Biostatistics 150, Genetics 122 or Epidemiology 160 or permission of the instructor. Critical analysis of genetic issues in human disease. The genetics of cancer, heart disease, diabetes, mental illness, mental retardation, hypertension and arthritis will be covered. The application of genetic and epidemiological techniques will be examined. 3 lecture hours a week. Spring (alternate years). Swift.

270. SEMINAR IN GENETICS (Biology 270) (2). Prerequisite: permission of instructor. 2 seminar hours a week. Fall and spring, on occasion. Lucchesi, Maroni, Pukkila.

275. GENETICS SYSTEMS (Microbiology 275, Biochemistry 275, Biology 275, Pathology 275) (3). An advanced course in genetics emphasizing the genetics and molecular biology of viruses, bacteria, fungi, insects and mammals and based upon the personal research of the staff. Required of all candidates for the degree in Genetics. 3 lecture hours a week. Fall (alternate years). Staff.

281. STATISTICAL METHODS IN HUMAN GENETICS (Biostatistics 281) (3). Prerequisite: permission of the instructor. An introduction to statistical procedures for genetic counseling, testing genetic hypotheses and estimating genetic parameters from human data. Topics covered include models for monogenic autosomal and X-linkage, mutation and selection, polygenic inheritance. Special emphasis will be given to segregation and linkage analysis. 3 lecture hours a week. Spring (alternate years). Biostatistics staff.

305. RESEARCH IN GENETICS (3 or more). Prerequisite: permission of the instructor. Throughout the year. Staff.

350. TRAINING IN GENETICS TEACHING (3). Prerequisites: two courses in genetics and permission of the instructor. Required for majors. Principles of genetics pedagogy. Students will be responsible for assistance in teaching genetics and will work under the supervision of the faculty with whom they will have regular discussion of methods, content and evaluation of performance. Throughout the year. Staff.

394. DOCTORAL DISSERTATION (3 or more). Throughout the year. Staff.

400. GENERAL REGISTRATION (0).

Curriculum in Neurobiology

The Neurobiology Curriculum of The University of North Carolina at Chapel Hill includes faculty from the departments of Cell Biology and Anatomy, Anesthesiology, Biochemistry and Nutrition, Biology, Biostatistics, Medicine, Neurology, Oral Biology, Oral Surgery, Pathology, Pharmacology, Physiology, Psychiatry, Psychology, Surgery, the Curriculum in Genetics, the Curriculum in Biomedical Engineering and Mathematics, and the Program in Molecular Biology and Biotechnology. The theme unifying members of these diverse departments is a desire to understand the mechanisms by which the nervous system functions. While sharing this fundamental interest in the nervous system, research techniques used by members of the Curriculum are quite diverse and provide the student with the opportunity to master a wide variety of laboratory skills.

Graduate students working toward the Ph.D. in Neurobiology must take Neurobiology 101, 111, 112, 122, 200, 201a or 202, 203, 227, 290, and 394, as well as other courses suggested by the Associate Director of Training. Similar course arrangements are made for Ph.D./M.D. candidates.

Special fellowships, commensurate with grants-in-aid, are available to support graduate students who are working toward the Ph.D. degree under the direction of a faculty member in the Neurobiology Program, and who major in Neurobiology. After the second year, graduate students are eligible to receive travel awards to attend national scientific meetings.

Inquiries and requests for applications should be addressed to The Graduate School, CB 4010, 200 Bynum Hall, The University of North Carolina, Chapel Hill, NC 27599-4010.

PROFESSOR

G. S. Oxford (Curriculum Director—appointed 6/30/89) (Physiology)

G. R. Breese (Psychiatry, Pharmacology)

L. Dykstra (Psychology)

F. L. Eldridge (Medicine, Physiology)

P. Farel (Acting Curriculum Director 07/01/88—06/30/89) (Physiology)

M. Gallagher (Psychology)

L. I. Gilbert (Biology)

E. Glassman (Biochemistry and Nutrition)

J. S. Hanker (Oral Biology)

T. K. Harden (Pharmacology)

J. N. Hayward (Neurology)

O. W. Henson (Cell Biology and Anatomy, Surgery)

D. S. Janowsky (Psychiatry)

R. N. Johnson (Neurology, Biomedical Engineering and Mathematics)

R. A. King (Psychology)

J. S. Kizer (Medicine)

J. M. Lauder (Cell Biology and Anatomy)

R. B. Mailman (Psychiatry, Pharmacology)

D. L. McIlwain (Physiology)

G. W. Meissner (Biochemistry and Nutrition, Physiology)

P. Morell (Curriculum Director — resigned as Director 6/30/88) (Biochemistry and Nutrition)

R. A. Mueller (Anesthesiology, Pharmacology)

E. R. Perl (Physiology)

P. Petrusz (Cell Biology and Anatomy)

A. J. Prange (Psychiatry)

A. Rustioni (Cell Biology and Anatomy, Physiology)

P. G. Shinkman (Psychology)

A. E. Stuart (Physiology, Ophthalmology)

W. E. Stumpf (Cell Biology and Anatomy, Pharmacology)

Kinuko Suzuki (Pathology)

Kunihiko Suzuki (Neurology, Psychiatry)

B. L. Whitsel (Physiology)

R. M. Wightman (Chemistry)

R. H. Wiley (Biology)

J. Wilson (Biochemistry and Nutrition)

ASSOCIATE PROFESSOR

W. E. Bollenbacher (Biology)

T. W. Bouldin (Pathology, Ophthalmology)

R. J. Dingledine (Pharmacology)

J. C. Garbutt (Psychiatry)

R. Glasser (Physiology)

R. S. Greenwood (Neurology, Pediatrics, Medicine)

J. F. Howard, Jr. (Neurology)

H. S. Hsiao (Biomedical Engineering and Mathematics)

D. Lay (Cell Biology and Anatomy)

M. Lewis (Psychiatry)

A. R. Light (Physiology)

P. K. Lund (Physiology)

P. F. Maness (Biochemistry and Nutrition)

J. D. Mann (Neurology, Medicine)

L. M. Marshall (Physiology)

K. D. McCarthy (Pharmacology)

D. E. Millhorn (Physiology)

B. S. Pallotta (Pharmacology)

H. B. Peng (Cell Biology and Anatomy)

T. C. Peng (Pharmacology)

R. Sealock (Physiology)

ASSISTANT PROFESSOR

G. Essick (Removable Prosthodontics)

M. Goy (Physiology)

B. K. Kay (Biology)

K. C. Light (Psychiatry)

W. Maixner (Removable Prosthodontics)

R. B. Meeker (Neurology)

C. Pederson (Psychiatry)

B. Popko (Biochemistry and Nutrition)

R. G. Rohwer (Microbiology and Immunology)

R. Rosenberg (Pharmacology, Physiology)

J. P. Ting (Microbiology and Immunology)

A. Willard (Physiology)

ADJUNCT PROFESSOR

C. L. Mitchell (Pharmacology)(Chief, Laboratory of Behavioral and Neurological Toxicology, NIEHS)

ADJUNCT ASSOCIATE PROFESSOR

H. A. Tilson (Toxicology)

J. Hong (Toxicology)

RESEARCH ASSOCIATE PROFESSOR

R. E. Fyffe (Physiology)

R. C. MacPhail (Psychology)

M. Sar (Cell Biology and Anatomy)

CURRICULUM

Courses for Graduates and Advanced Undergraduates

100. BIOCHEMISTRY FOR STUDENTS OF BIOLOGY AND CHEMISTRY (Biochemistry 100, Biology 107) (3). Prerequisites: Chemistry 61 and one course in biology. Lectures on the mechanism and regulation of reactions in living organisms, with emphasis on general principles. Protein structure and enzyme function; central pathways in intermediary metabolism; metabolic control; expression of genetic information; active transport. Fall. Wolfenden, staff.

101. NEUROANATOMY (Cell Biology and Anatomy 101) (3). The central nervous system and organs of special sense. 3 lecture hours a week. Fall. Rustioni.

101c. CONDITIONING AND LEARNING (Psychology 101) (3). Prerequisites: Psychology 10 and 22. A comprehensive survey of the methods, findings, and theories of classical and operant conditioning. Skills necessary to evaluate, integrate and summarize significant original literature will be developed. Fall. Eckerman.

102. BIOLOGICAL FOUNDATIONS OF BEHAVIOR (Psychology 102) (4). Prerequisite: Psychology 22 or Zoology 11. Ethnological, genetic and physiological variables will be studied in relation to their behavioral effects. 2 lecture and 3 laboratory hours a week. As announced. Staff.

106. PHYSIOLOGICAL PSYCHOLOGY (Psychology 106) (3). Prerequisite: Psychology 10, or a course in Biology. Elements of neurophysiology, neuroanatomy, and neurochemistry as they apply to the understanding of behavior and conscious experience. Fall and spring. Gallagher, King.

110. TECHNIQUES IN PHYSIOLOGICAL PHARMACOLOGY (Pharmacology 110) (3). Prerequisites: Pharmacology 202 and permission of the instructor. Students will learn and perform a variety of physiological techniques often used in classical pharmacological research. 1 lecture and 6 laboratory hours a week. As announced. Spring. Staff.

111–112. NEUROBIOLOGY LABORATORY APPRENTICESHIP (3–9). Prerequisite: permission of the Director of Training of the Neurobiology Curriculum. A laboratory-tutorial course to acquaint the student with methods used in several areas of neurobiology. Fall and spring. Faculty of the Neurobiology Curriculum.

118. NEUROENDOCRINOLOGY (Cell Biology and Anatomy 118, Pharmacology 118) (2). Prerequisite: permission of the instructor. A review of presently held concepts in neuroendocrinology with emphasis on topographical aspects of brain structures related to hormone action. 2 lecture hours a week. Spring (1988 and alternate years). Stumpf, Sar.

122. DEVELOPMENTAL NEUROBIOLOGY (Cell Biology and Anatomy 122; Physiology 122) (3). Prerequisite: permission of instructor. A comprehensive overview of nervous system development including detailed analysis of selected research topics in developmental neuroanatomy. Spring (1987 and alternate years). 3 lecture hours a week. Lauder, Farel, Willard.

123. BEHAVIORAL PHARMACOLOGY (Pharmacology 123, Psychology 123) (3). Prerequisites: Pharmacology 202, or Psychology 101 and 106, or equivalent. Basic principles of pharmacology and the experimental analysis of animal behavior will be considered in relation to drugs that affect the central nervous system. 3 lecture hours a week. As announced. Spring. Staff.

125. INTRODUCTION TO NEUROPHYSIOLOGY (Biology) (3). Prerequisite: Biology 52 or permission of the instructor. The neurophysiological basis of behavior with emphasis on structure and function of membranes, neurons, synapses, and complex functional units of nervous systems. 3 lecture hours a week, on occasion. Staff.

140. CELL AND ORGAN SYSTEM PHYSIOLOGY (Physiology 140) (5). Prerequisite: none, but a prior course in biochemistry facilitates understanding. A lecture/recitation course with emphasis on principles as well as the body of knowledge. Includes some discussion of key experimental approaches and the progression from physiological to molecular understanding as appropriate. Fall. Sealock, staff.

150. NEUROBIOLOGY (3). Prerequisite: permission of instructor. A tutorial in selected topics in neurobiology tailored to meet interests of the students and competencies of instructors. Fall and spring. Staff.

200. ADVANCED NEUROPHYSIOLOGY (Physiology 204) (4). Prerequisites: Physiology 140, working knowledge of mammalian neuroanatomy and permission of course director. A course designed to provide detailed analysis of selected areas of neurophysiology, such as synaptic transmission, sensory and motor systems, and higher integrative mechanisms. Fall. 3 lectures, 2 laboratories per week. Stuart, staff.

201a. BEHAVIOR AND ITS BIOLOGICAL BASES I. (Psychology 201) (3). A survey of psychological and biological approaches to the study of sensory and perceptual information processing and of attention and arousal; comparative, ethnological, and developmental perspectives on behavior; behavioral medicine. Fall. Shinkman, Hollin.

201c. BIOMEDICAL INSTRUMENTATION (BMME 111) (3). Prerequisite: Physics 101 or equivalent, or permission of the instructor. Topics include analysis of medical instrumentation with emphasis on pressure, flow, bioelectric, and ultrasonic transducers. This course includes a laboratory and interfaces microprocessors with transducers. Students are given the opportunity to design and fabricate original devices. Spring. Buchanan.

202. BEHAVIOR AND ITS BIOLOGICAL BASES II (Psychology 202) (3). A survey of psychological and biological approaches to the study of basic learning and higher integrative processing. Fall. Eckerman, Gallagher, Kind, Dykstra, staff.

203. SYNAPTIC PHARMACOLOGY (Pharmacology 203) (3). Prerequisite: Pharmacology 202 or permission of instructor. An in-depth consideration of biochemical and physiological bases for actions of neuroactive drugs and their possible sites of action in terms of identified pathways and synapses in the brain. 3 lecture hours a week. Fall. McCarthy, Dingledine, Harden.

204. ADVANCED BIOLOGICAL PSYCHOLOGY: CENTRAL NERVOUS SYSTEM (Psychology 204) (3). Prerequisite: Psychology 106 or equivalent. Each fall one specific topic will be covered in depth, e.g., neural bases of memory storage, homeostasis, and perception. Format will include lecture and seminar meetings with student presentations. Fall. Shinkman.

205. ADVANCED BIOLOGICAL PSYCHOLOGY:AUTONOMIC NERVOUS SYSTEM (Psychology 205) (3). Prerequisites: Psychology 106 and/or 202, or permission of the instructor. Autonomic nervous system bases of emotion, motivation, and learning. 2 lecture and 2 laboratory hours a week, on demand. Staff.

211, 212. SPECIAL TOPICS IN PHYSIOLOGY (Physiology 211, 212) (3-5). Prerequisite: permission of the instructor. Individually arranged in-depth programs of selected topics, such as membrane function, transport physiology, renal physiology, etc. Fall and spring. Staff.

221. NEURAL INFORMATION PROCESSING (BMME 221) (3). Prerequisites: BMME 103 and Physiology 140 or equivalent. This course approaches the nervous system as a data-processing network, and the brain as the computer for a homeostat. On occasion. Coulter.

225. EXPERIMENTAL NEUROPHYSIOLOGY (Biology 225) (3). Prerequisite: permission of the instructor. 6 or more laboratory hours a week, on occasion. Staff of Neurobiology Curriculum.

227. NEUROCHEMISTRY (Biochemistry 227) (3). Prerequisite: Two semesters of biochemistry. An introductory course in the biochemistry of the nervous system. Topics include aspects of energy metabolism, ion movements, neurotransmitters, intermediary metabolism, and molecular biology in the nervous system. Fall (1990 and alternate years). Wilson, Morell.

235. SEMINAR IN CHEMICAL NEUROBIOLOGY (Biochemistry 235) (2). Prerequisite: 2 semesters of biochemistry. Fall (1991 and alternate years). Wilson, Morell.

259. SEMINAR IN COMPARATIVE ANIMAL BEHAVIOR (Biology 259) (2). Prerequisite, permission of instructor. Fall. Mueller, Wiley.

260. SEMINAR IN COMPARATIVE PHYSIOLOGY (Biology 260) (2). Prerequisite: Biology 120, or permission of the instructor. Spring. Staff.

290. SEMINAR IN NEUROBIOLOGY (Biochemistry 290) (2) (Physiology 290, Pathology 290, Pharmacology 290) (3). Prerequisite: permission of the Director of the Neurobiology Curriculum. An intensive consideration of selected topics and problems in neurobiology. The course will focus on the development of presentation and evaluation skills of the trainees. Participation required of Neurobiology Trainees. Spring. Faculty of the Neurobiology Curriculum.

302. SEMINAR IN THE BIOLOGICAL FOUNDATIONS OF PSYCHOLOGY (Psychology 302) (3). Prerequisite: permission of instructor. Limited to graduate students in psychology and neurobiology. Lectures and seminar presentations on a wide range of topics in the area of physiological psychology. Fall and spring. King, Gallagher.

310. RESEARCH IN NEUROBIOLOGY (Biochemistry 310, Pathology 310, Pharmacology 310,Biology 302, Physiology 310, Psychology 310) (3-12). Prerequisite: permission of a staff member. Research in various aspects of neurobiology. 6 to 24 hours a week. Fall and spring. Faculty of the Neurobiology Curriculum.

394. DOCTORAL DISSERTATION (0 or more). Fall, spring and summer. Research advisor.

400. GENERAL REGISTRATION (0).

Curriculum in Toxicology

The Curriculum in Toxicology administers degree programs leading to the award of the Ph.D. in Toxicology and the M.S. in Toxicology. The Curriculum is an interdisciplinary program, and its faculty is drawn from various administrative units of the Schools of Medicine, Pharmacy, and Public Health. The research interests of the faculty are directed primarily at the biochemical and physiological mechanisms of action in mammalian systems. The interests include most areas of toxicology, but major emphases are directed towards: biochemical toxicology including xenobiotic metabolism; heavy metal toxicology; neurotoxicology including behavioral toxicology; pulmonary and inhalation toxicology; and carcinogenesis and mutagenesis. The faculty generally does not conduct research in the areas of aquatic toxicology, forensic toxicology, the ecological aspects of toxicology, or studies in invertebrate systems. The research activities of the Curriculum in Toxicology are conducted in the laboratory facilities assigned to each faculty member by a participating administrative unit.

Applications

Applications for predoctoral studies are considered from students who have received or expect to receive a B.S./B.A. or M.S. degree in a scientific discipline. A desirable background includes courses in biological sciences (including histology and animal physiology), in chemistry (including analytical, organic and physical), and mathematics through calculus, although all of these are not absolutely essential. A strong course in general biochemistry accelerates the student's progress. Applicants are evaluated on the basis of undergraduate (and graduate) academic performance, Graduate Record Examination scores (General Test and Subject Test, if the latter is given in the field of the undergraduate major), and letters of recommendation. Students are accepted on the basis of their achievement and potential. Special circumstances, including prior research experience and publications, are considered in individual cases in the assessment of qualifications for admission. Students are encouraged to proceed for the Ph.D. degree without an intermediate M.S. degree from the Curriculum. The Curriculum will offer a program leading to the M.S. degree only under special circumstances.

Requirements for the Ph.D. Degree

The selection of a predoctoral student's graduate courses is influenced by that student's prior academic background. The minimum academic courses for graduate training in toxicology constitute approximately 38 credit hours in didactic courses including biochemistry (two courses), biostatistics, epidemiology, histology, pathology, pharmacology (two courses), physiology, toxicology (special problems) and three elective courses. In addition, each predoctoral student is expected to participate in 12 credit hours of non-didactic training activities, i.e., two semesters of laboratory research experience prior to the doctoral research and four seminars. The satisfactory completion of appropriate courses during the prior academic career permits a student to have a greater latitude in the selection of courses.

A major requirement for the Ph.D. degree is a doctoral dissertation based on the student's independent laboratory research. Written and oral examinations are required in the fields of general toxicology and the major research interest.

Financial Aid

The Curriculum seeks to fund predoctoral students each year. All applicants are considered for financial aid.

PROFESSOR

T. S. Miya (Curriculum Director) (Pharmacy, Pharmacology)

K. H. Dudley (Pharmacology)

M. Friedman (Medicine)

J. T. Gatzy, Jr. (Pharmacology)

A. Gold (Environmental Sciences and Engineering)

J. W. Grisham (Pathology)

I. H. Hall (Medicinal Chemistry)

D. G. Kaufman (Pathology)

J. M. Lauder (Cell Biology and Anatomy)

J. J. Lemasters (Cell Biology and Anatomy)

R. B. Mailman (Psychiatry)

P. Morell (Biochemistry and Nutrition)

C. M. Shy (Epidemiology)

W. E. Stumpf (Cell Biology and Anatomy)

K. I. Suzuki (Pathology)

R. G. Thurman (Pharmacology)

A. G. Turner, Jr. (Environmental Sciences and Engineering)

ASSOCIATE PROFESSOR

T. W. Bouldin (Pathology)

S. G. Chaney (Biochemistry and Nutrition)

B. Goz (Pharmacology)

C. Harper (Pharmacology)

D. J. Holbrook, Jr. (Associate Chairman) (Biochemistry and Nutrition)

M. H. Lewis (Psychiatry)

M. D. Topal (Pathology)

ASSISTANT PROFESSOR

J. C. Azizkhan (Pediatrics, Pharmacology)

L. M. Ball (Environmental Sciences and Engineering)

K. R. Brouwer (Pharmaceutics)

M. Cordeiro-Stone (Pathology)

W. K. Kaufmann (Pathology)

G. M. Pollack (Pharmaceutics)

G. J. Smith (Pathology)

T. D. Tlsty (Pathology)
J. M. Vos (Biochemistry and Nutrition)

RESEARCH ASSOCIATE PROFESSOR

M. J. Hazucha (Medicine)

ADJUNCT PROFESSOR

L. S. Birnbaum (Environmental Sciences and Engineering)
J. R. Fouts (Pharmacology)
G. E. R. Hook (Toxicology)
G. W. Lucier (Biochemistry and Nutrition)
E. J. Massaro (Toxicology)
P. Nettesheim (Pathology)
M.D. Waters (Toxicology)

ADJUNCT ASSOCIATE PROFESSOR

J. W. Allen (Toxicology)
J. C. Barrett (Pathology)
M. R. Blum (Pharmaceutics)
A. R. Brody (Toxicology)
T. E. Eling (Toxicology)
H. d'A. Heck (Toxicology)
J. S. Hong (Toxicology)
R. P. Mason (Toxicology)
R. M. Philpot (Toxicology)
L. W. Reiter (Pharmacology)
D. E. Rickert (Toxicology)
H. A. Tilson, Jr. (Toxicology)
W. A. Wargin (Toxicology)
F. Welsch (Toxicology)

VISTING PROFESSOR

J. A. Swenberg (Pathology)

VISTING ASSOCIATE PROFESSOR

J. A. Raleigh (Radiation Oncology)
T. R. Skopek (Pathology)

CURRICULUM

Courses for Graduates and Advanced Undergraduates

123. DEVELOPMENTAL TOXICOLOGY AND TERATOLOGY (Cell Biology and Anatomy 123) (2). Review of aspects of development which are particularly susceptible to teratogenic insults; mechanisms by which teratogens affect development. 2 lecture hours per week. Spring (1990 and alternate years). Cell Biology and Anatomy staff.

142. BIOCHEMICAL TOXICOLOGY (Biochemistry 142) (3).. Prerequisite: Biochemistry 100, and one additional biochemistry course (or permission of course director). Biochemical actions of toxicants and assessment of cellular damage by biochemical measurements. Course intended primarily for graduate students. 3 lecture hours per week. Spring. Holbrook.

Courses for Graduates

202. PRINCIPLES OF PHARMACOLOGY AND TOXICOLOGY (Pharmacology 202) (5). Prerequisites: Biochemistry 100, Physiology 140, or their equivalents, and permission of the instructor. Introduces the major areas of pharmacology and toxicology and serves as a basis for more advanced courses. 5 lecture hours per week. Spring. Pharmacology staff.

207. RECENT ADVANCES IN TOXICOLOGY (Pharmacology 207) (2). Prerequisite: Pharmacology 202 or permission of the instructor. Recent advances in cardio-, hepato-, and pulmonary toxicology and the mode of action of heavy metals, toxins from plants and animals, solvents and propellants, insecticides, and halogenated hydrocarbons. 2 lecture hours per week. Fall. Gatzy.

209. BIOTRANSFORMATION OF XENOBIOTICS (Pharmacology 209) (2). Prerequisite: Biochemistry 100 or equivalent, or Pharmacology 202, or permission of instructor. Recent advances in the mechanisms by which drugs and other foreign chemicals are metabolized to active and/or inactive products. The importance of metabolic pathways to therapy/toxicity. 2 lecture hours per week. Fall. Harper, Dudley, Thurman.

215. INTRODUCTION TO TOXICOLOGICAL RESEARCH (4). Prerequisite: permission of course director. Introductory laboratory experience from research projects of limited scope to acquaint students with the experimental approaches, techniques and equipment of current research in toxicology. May be repeated. 12 laboratory hours per week. Fall, spring and summer. Toxicology faculty.

219. SPECIAL PROBLEMS IN TOXICOLOGY (2). Orientation to the principles of toxicology (including methodology, risk assessment, and aspects of regulation and socioeconomic issues) as encountered in research institutes, governmental regulatory agencies and industry. Presented at Research Triangle Park by senior scientific staff from Burroughs Wellcome Company, Chemical Industry Institute of Toxicology, Environmental Protection Agency, and National Institute of Environmental Health Sciences. 3 hours per week for 12 weeks. Summer (alternate years).

221. SEMINAR IN TOXICOLOGY (1). Prerequisite: permission of course coordinator for non-majors. Student-conducted presentations and discussions of recent advances in toxicology; emphasis on critical evaluation of published investigations and on organization and oral delivery of presentations. May be repeated up to six times. 1 hour per week. Fall and spring. Toxicology faculty.

260. TOXICOKINETICS (Pharmaceutics 260) (3). A quantitative examination of the time course of absorption, distribution, metabolism, excretion, and biologic effects of agents of toxicologic interest. 3 lecture hours per week. Spring (1990 and alternate years). Pollack, Brouwer.

292. SEMINAR IN CARCINOGENESIS (Pathology 292) (2). Prerequisite: permission of instructor. Survey of classical and current literature on selected critical issues in carcinogenesis. Discussions consider experimental methods and observations as well as theories and generalizations. 2 seminar hours per week. Fall (1989 and alternate years). Kaufman.

301. RESEARCH IN TOXICOLOGY (3–9). Prerequisite: permission of course director for non-majors. May be repeated for credit. Hours and credits to be arranged. Fall, spring and summer. Toxicology faculty.

393. MASTER'S THESIS (0–9). May be repeated. Hours and credits to be arranged. Fall, spring and summer. Toxicology faculty.

394. DOCTORAL DISSERTATION (0–9). May be repeated. Hours and credits to be arranged. Fall, spring and summer. Toxicology faculty.

400. GENERAL REGISTRATION (0).

Registration for the following is through Inter-Institutional Registration.

GENERAL PATHOLOGY FOR TOXICOLOGISTS (Duke University, Pathology 382) (3). Prerequisites: biochemistry, physiology, microbiology and histology, or by special permission of the course director. General principles of pathology and pathobiology for graduate students in toxicology who do not have a background in medicine. Principles of cell injury, inflammation, circulatory disturbances, and neoplasia using toxicological principles and models. Presented jointly by faculty members from both Duke University and this University. Lecture and laboratory hours. Fall (1989 and alternate years). Graham (Duke).

Centers, Divisions and Offices

Biological Sciences Research Center

Director: Kunihiko Suzuki, M.D., Professor of Neurology and Psychiatry

Sections and Section Heads: Neurochemistry, Pierre Morell, Ph.D. (Biochemistry and Nutrition), Arrel Toews, Ph.D. (Biochemistry and Nutrition); Neuropharmacology, George R. Breese, Ph.D. (Psychiatry and Pharmacology), H. Criswell, Ph.D. (Psychiatry); Neurotoxicology, Richard B. Mailman, Ph.D. (Psychiatry and Pharmacology), Mark Lewis, Ph.D. (Psychiatry and Psychology); Developmental and Biochemical Neuroendocrinology, J. Stephen Kizer, M.D. (Medicine and Pharmacology); Psychoendocrinology, Arthur J. Prange, Jr., M.D. (Psychiatry), Cort Pedersen, M.D. (Psychiatry), George Mason, Ph.D. (Psychiatry); Molecular Biology and Biochemistry of Neurogenetic Disorders, Kunihiko Suzuki, M.D. (Neurology and Psychiatry), Brian Popko, Ph.D. (Biochemistry and Nutrition, and Program in Molecular Biology and Biotechnology); Biochemical Genetics and Metabolism, H. Neil Kirkman, M.D. (Pediatrics), Arthur Aylsworth, M.D. (Pediatrics), Kathleen Rao (Pediatrics); Medical Genetics, Michael R. Swift, M.D. (Medicine); Neuropathology, Kinuko Suzuki, M.D. and Thomas Bouldin, M.D. (Pathology); Computerized Molecular Modeling, Phil Bowen, Ph.D. (School of Pharmacy); Biological Psychology, Paul Shinkman, Ph.D. (Psychology); Neuroanatomy, Walter Stumpf, Ph.D. (Cell Biology and Anatomy); Treatment and Education of Autistic and related Communication Handicapped Children (TEACCH), Eric Schopler, Ph.D. (Psychiatry and Psychology).

The Biological Sciences Research Center of the School of Medicine is one of the three centers comprising The University of North Carolina Child Development Institute, an interdisciplinary program of research and training in mental retardation.

The Biological Sciences Research Center, located on the School of Medicine campus, is concerned with biomedical research in the general areas of normal and pathological development of the nervous system. The program encompasses a wide range of research interests and approaches that utilize appropriate disciplinary tools, such as molecular biology, genetics, biochemistry, pharmacology, endocrinology, and pathology. Basic developmental neurobiology and molecular genetics explore processes of normal brain development and provide the foundation on which to build other research programs. Integration of basic research efforts with clinical research and application is always consciously sought whenever possible. Specific research projects include: molecular biological studies to identify specific mutations on the DNA level in well-defined genetic neurological disorders; manipulation of murine neurological mutants with the transgene technology; DNA linkage studies for forms of mental retardation with strong genetic components, such as specific subsets of autism, genetic studies dealing with genes that increase the risk for both physical illness and mental retardation; biochemistry and enzymology of neuropeptide-processing enzymes; long-term effects of neurotoxins and environmental pollutants; neuroendocrine influence on mental retardation and childhood psychosis; an interdisciplinary program on self-injurious behavior, one of the most common and troublesome behavioral defects; acute and long-term biological and behavioral effects in animals and human patients of psychotropic drugs commonly used in the management of behavioral disorders associated with mental retardation. In addition to these research projects, the Biological Sciences Research Center also administers the Genetic Counseling Program for the State of North Carolina under Dr. Arthur Aylsworth.

Center for Alcohol Studies

Director: David S. Janowsky, M.D., Professor of Psychiatry

Deputy Director: Mario Perez-Reyes, M.D., Professor of Psychiatry

Associate Director: Amir Rezvani, Ph.D., (Biology) Assistant Professor of Psychiatry

Affiliated Members: George Breese, Ph.D. (Psychiatry, Pharmacology); Hugh Criswell, Ph.D. (Psychiatry); Thomas McCown, Ph.D. (Psychiatry); Ronald Thurman, Ph.D. (Pharmacology); J. C. Garbutt, M.D. (Psychiatry); Robert Hicks, Ph.D. (Psychiatry); Cort Pedersen, M.D. (Psychiatry); Claudia Clayton, Ph.D. (Psychiatry)

The Center for Alcohol Studies was established in 1970 with State support and the mandate to promote, coordinate, and conduct training and research into the problems associated with alcohol abuse and alcoholism. Current research areas include: clinical studies on the interaction between alcohol and commonly prescribed and/or abused drugs; the effects of alcohol on metabolic, neuroendocrine, behavioral, and neuropsychologic parameters in human subjects, and; studies of differences between high and low risk for alcoholism in young adults. Preclinical studies focus on the neurophysiologic and neurochemical central nervous system effects of alcohol and its metabolic products in alcohol preferring and non-preferring animals. A close coordination between clinical and basic science research in alcoholism exists among the Center's scientists and affiliated scientists in the department of Pharmacology and Psychiatry, the Biological Sciences Research Center and the Clinical Research Unit of the Dorothea Dix Hospital, located in Raleigh, North Carolina.

The Center has administrative offices and clinical laboratories located in Wing B of the Medical School, and clinical and preclinical laboratories located in Medical Research Building A. Library and information services relating to alcohol research are provided to researchers and interested public.

Center for Environmental Medicine

Director: Philip A. Bromberg, M.D. (Medicine)

Associate Director: Albert M. Collier, M.D. (Pediatrics)

Program Leaders: William Bennett, Ph.D., Medicine); Brian A. Boehlecke, M.D. (Medicine); Johnny L. Carson, Ph.D. (Pediatrics); Mitchell Friedman, M.D. (Medicine); Milan J. Hazucha, M.D. , Ph.D. (Medicine); Frederick W. Henderson, M.D. (Pediatrics); Marianna Henry, M.D. (Pediatrics); P-C Hu, Ph.D. (Pediatrics); Gary Koch, Ph.D. (Biostatistics, School of Public Health); Walter Kozumbo, Ph.D. (Center for Environmental Medicine); Lester Kwock, Ph.D. (Radiology); David Leith, Ph.D. (Environmental Sciences and Engineering, School of Public Health); Michael Madden, Ph.D.; William McCartney, M.D. (Radiology); David S. Sheps, M.D. (Medicine).

The Center for Environmental Medicine and Lung Biology of the School of Medicine was established in 1979 and is broadly concerned with environmental impacts on human health and respiratory health in particular. Multidisciplinary approaches are used to study the effects of inhaled agents on diseased as well as healthy human subjects. Human cells and cell lines are studied in vitro. The Center is particularly concerned in coordinating the responses of university faculty to State and Federal needs in this area and to develop appropriate applied and basic research programs as well as educational and training opportunities. At the present time, two graduate students and eight postdoctoral trainees are pursuing research projects at the Center.

The Center has administrative offices located in the Medical Research Building C area and laboratories in Medical Research Building B, as well as access to the sophisticated human and animal environmental exposure facilities of the Inhalation Toxicology Division, U.S. Environmental Protection Agency, located on the Chapel Hill campus and in Research Triangle Park. Approximately 30 investigators from several departments in the Schools of Medicine and Public Health have been involved in Center activities. Many collaborate closely with EPA scientists.

The Center has a general cooperative agreement with the U.S. Environmental Protection Agency, and grants to individual investigators from various sponsors, including NIH and the American Lung Association. The Center sponsors a variety of seminars, visiting scientists and research conferences related to basic and clinical studies in environmental health sciences.

Center for Thrombosis and Hemostasis

Director: Harold R. Roberts, M.D., Professor of Medicine

Associate Directors: Gilbert C. White, II, M.D. Professor of Medicine and Richard G. Hiskey, Ph.D., Professor of Chemistry

The Center for Thrombosis and Hemostasis was established to promote interdisciplinary research (both basic and clinical); to improve care of patients having diseases related to thrombosis and hemorrhage; and to provide advanced training for young scientists interested in these problems. Congenital and acquired disorders related to thrombosis and hemostasis constitute a major health problem throughout the world.

The Center has administrative offices in the School of Medicine. There are over 50 investigators from multiple departments in the School of Medicine, the School of Dentistry, the School of Public Health, the Department of Chemistry and the Department of Biology, involved in the activities of the Center.

In addition to grants to individual investigators, the Center has two CORE research grants: 1. Specialized Center of Research in Thrombosis and Hemostasis with Dr. Harold R. Roberts as Principal Investigator, and ; 2. Program Project Grant in Thrombosis and Hemostasis with Dr. Harold R. Roberts as Principal Investigator. A Comprehensive Hemophilia Diagnostic and Treatment Center constitutes part of the clinical activities of the Center for Thrombosis and Hemostasis, and is under the direction of Dr. Campbell McMillan.

Operating within the structure of the Center is a postdoctoral training grant for young investigators, both M.D.'s and Ph.D.'s, who aspire to careers as basic or clinical scientists in an academic setting. The training grant is administered by Dr. Harold R. Roberts. A Division of Research in Thrombosis is headed by Dr. Dana Fowlkes and is part of the Center for Thrombosis and Hemostasis.

The Center facilitates basic and clinical research in the area of thrombosis and hemorrhage through seminars, conferences, workshops and study groups.

The Center also coordinates the efforts of multidisciplinary groups attempting to apply basic research findings to clinical situations as quickly as possible.

The Center sponsors weekly seminars on basic and clinical studies, mini-symposia and bi-annual international symposia. Visiting scientists from the United States and other countries regularly participate in the conferences.

The Clinical Research Unit

Director: Eugene P. Orringer, M.D. (Medicine) (Appointed 1989), Robert D. Utiger, M.D. (Medicine) (Resigned 1989)

Associate Program Director: David R. Clemmons, M.D. (Medicine)

Chairman, Clinical Research Unit Scientific Advisory Committee: Louis D. Underwood, M.D. (Pediatrics)

The Clinical Research Unit (CRU) of the School of Medicine at the University of North Carolina represents one of only eight original Clinical Research Centers still in existence that were funded by the federal government in 1960. The purpose of the CRU is to provide a setting where all members of the faculty of the School of Medicine are able to investigate problems of normal and abnormal human physiology. The CRU is presently in its thirtieth consecutive year of grant support from the Division of Research Resources of the National Institutes of Health.

Although the CRU is located within the confines of the University of North Carolina Hospitals, it functions as an independent, discrete facility with its own nursing staff, research dietitian and metabolic kitchen, research core laboratory and computer center. The policies and activities of the Clinical Research Unit are guided by the Clinical Research Unit Scientific Advisory Committee, the composition of which includes broad representation from the clinical departments of the School of Medicine. All members of the Committee are appointed by the Dean of the School of Medicine, who also serves as the principal investigator on the Clinical Research Center grant from the National Institutes of Health.

Division of Laboratory Animal Medicine

Director: James R. Pick, D.V.M. (Pathology)

Associate Director: Jerjang Chang, D.V.M., Ph.D. (Pathology)

Clinical Veterinarian: Dwight A. Bellinger, D.V.M., Ph.D. (Pathology)

The Division of Laboratory Animal Medicine provides support for all of the animal-related teaching and research activities conducted by the staff of the School of Medicine. The veterinary staff is also responsible for the humane use and health care of all laboratory animals on the Chapel Hill campus.

The Division offers postdoctoral training in laboratory animal medicine to a limited number of qualified veterinarians. A program in comparative pathology is offered in cooperation with the Department of Pathology. Members of the staff are available to answer questions related to utilization of laboratory animals, and to advise individuals interested in pursuing careers in veterinary medicine. The offices of the division are located in Berryhill Hall on the campus of the School of Medicine.

Division of Laboratory Medicine

Director: William W. McLendon, M.D. (Pathology-Hospital Laboratories).

Laboratory Directors:

Clinical Chemistry Laboratories: Robert E. Cross, Ph.D. (Pathology, Biochemistry and Nutrition)

Microbiology/Immunology Laboratories: James D. Folds, Ph.D. (Microbiology and Immunology, Pathology)

Laboratory Computer Services: John E. Hammond, Ph.D. (Pathology)

Blood Bank: Myra L. Collins, M.D., Ph.D. (Pathology)

Clinical Coagulation Laboratory: Katherine A. High, M.D. (Medicine and Pathology)

Hematology Laboratory: Dennis W. Ross, M.D., Ph.D. (Pathology)

The Division of Laboratory Medicine was formed in 1973 as a multidisciplinary division in the School of Medicine for faculty members with a major clinical responsibility in the Hospital Laboratories and with educational and research activities in Laboratory Medicine. Currently there are over 15 faculty members with primary and secondary appointments in the Departments of Biochemistry and Nutrition, Medicine, Microbiology and Immunology, Pediatrics, and Pathology.

Division TEACCH

Director: Eric Schopler, Ph.D. (Psychology and Psychiatry)

This statewide community based program for the Treatment and Education of Autistic and related Communication Handicapped Children (TEACCH) is a division in the Department of Psychiatry of the School of Medicine. Comprehensive services are provided to autistic children, adolescents, adults and their families. These services include: diagnostic evaluations, individualized treatment, special classrooms, and parent training. Both research and professional training, based on this primary service, are important aspects of the program.

Division TEACCH includes administrative and research offices, five clinical centers, and consultative relationships with 95 classrooms and 10 group homes. The administrative and research offices, one clinical center, and one classroom are all located on the School of Medicine campus in Chapel Hill. The other four centers are located in Asheville, Greenville, Charlotte and Wilmington.

The Carolina Living and Learning Center is a learning and residential environment for adults that utilizes a collaborative teaching approach used at the younger levels, and an apprenticeship co-therapy relationship for learning new vocational skills.

Research has been an important aspect of the program since its beginning as the Child Research Project, which demonstrated that parents can indeed be the most effective co-therapists with their own children. In addition to research involving family life, treatment, and the management of autistic and communication handicapped children, Division TEACCH also studies the biological, behavioral, genetic, biochemical, and language factors in these disorders. Special education approaches, behavior modification techniques, and staff-family interactions are also evaluated.

Division TEACCH is also used for training in various professions. At Chapel Hill, the classroom program offers practicum experience in special education. Practicum and internship programs are available through the clinical psychology program. Students in child psychology, pediatrics, family medicine, psychology, special education, speech pathology, and child psychiatry learn through both seminars and clinical experience. In addition, each of the centers offers similar learning opportunities with other universities located in its vicinity. Intensive in-service training programs, workshops, and institutes have been offered with the involvement of TEACCH staff, parents, and children.

The goals of the program are to develop improved adaptation in the three major areas of the client's life—home, school, and community adjustment. The involvement and collaboration of parents is a special focus.

Lineberger Cancer Research Center

Director: Joseph S. Pagano, M.D., Professor of Medicine and Microbiology and Immunology, and Lineberger Professor of Cancer Research

Associate Director: H. Shelton Earp, M.D., Professor of Medicine and Pharmacology

Associate Director, Clinical Affairs: Howard Ozer, M.D., Ph.D., Professor of Medicine

Associate Director, Cancer Control: Wesley C. Fowler, Jr., M.D., Professor of Obstetrics and Gynecology.

Assistant Director: Shirley P. O'Keefe, M.S.P.H.

Program Leaders: H. Shelton Earp, M.D., Professor of Medicine and Pharmacology (Cancer Cell Biology, Acting); Suzanne W. Fletcher, M.D., Professor of Medicine (Cancer Control/Cancer Prevention); Jeffrey Frelinger, Ph.D., Kenan Professor of Microbiology and Immunology (Immunology); Eng-Shang Huang, Ph.D., Professor of Medicine and Microbiology and Immunology (Virology); Barbara S. Hulka, M.D., Chair and Professor of Epidemiology (Cancer Epidemiology); James F. Huth, M.D., Associate Professor of Surgery (Surgical Oncology); Rudolph L. Juliano, Ph.D., Chair and Professor of Pharmacology (Drug Development); David Kaufman, M.D., Ph.D., Professor of Pathology, and Biochemistry and Nutrition (Chemical Carcinogenesis); Howard Ozer, M.D., Ph.D., Professor of Medicine (Clinical Research); Joel Tepper, M.D., Chair and Professor of Radiation Oncology (Radiation Oncology).

The Lineberger Cancer Research Center of The University of North Carolina at Chapel Hill was established in 1975 in the School of Medicine. The activities of the cancer center are interdisciplinary with participation from both basic science and clinical departments of the School of Medicine, as well as the Schools of Public Health, Dentistry, Pharmacy, Nursing, and the Departments of Biology and Chemistry.

Administratively, the Center provides staff support for cancer-related activities in program planning, facilities planning, and faculty and staff recruitment. The Center acts as the organizational base for cancer-related activities of the UNC Health Affairs. The administrative offices and many of the research laboratories are located in the new 36,000 net square feet Lineberger Building which opened in 1985. In addition, many members of the Center continue to have research laboratories throughout the medical school and elsewhere in the University.

The Center has Basic Science and Clinical Programs. The Basic Science Programs are: Cancer Cell Biology, Chemical Carcinogenesis, Drug Development, Immunology, and Virology. The Basic Science Program operates a centralized tissue culture, glassware and media facility, electron microscopy facility, a light microscopy unit with UV and phase optics and photography, microinjection and transgenic mouse facilities, a drug development facility, and the analytical microscopy core facility which includes digitized video light microscopy and confocal microscopy. There are two biohazard facilities: BL3 for work with viruses, and chemical containment for research using chemical carcinogens.

The development of interdisciplinary oncology research programs is the main activity of the Clinical Research Programs which are in: Gynecology, Medicine, Pediatrics, Radiation and Surgical Oncology, including Radiobiology. Clinical research activities are broad with emphasis on the molecular and cell biology, immunology, genetics and endocrinology of malignancies. Program members participate in a wide variety of clinical protocols for research purposes through national clinical trials groups. Core facilities for the Clinical Research Program are an epidemiology-biostatistics unit, nucleic acids, tumor procurement and analysis, drug development resource, and protocol office.

Additional programs of the Center are in Cancer Control and Cancer

Epidemiology which promote and conduct research in the areas of health education, cancer detection and prevention, and epidemiology for the state of North Carolina. Much of this work is done in cooperation with the Area Health Education Centers of North Carolina.

The goals of the Lineberger Cancer Research Center are to provide an organizational framework for a basic cancer research center of regional and national excellence; to move promising research from the laboratory to the clinic as rapidly as possible, and; to provide state-of-the-art cancer treatment for patients with cancer.

The curricular goals of the Lineberger Cancer Research Center are implemented through the academic departments. The aims are to assist in providing students with a unified view of the molecular and biologic basis for cancer, as well as an integrated approach to the understanding of cancer. In addition there is an organized program for the postdoctoral training of basic cancer researchers.

The Lineberger Center sponsors a weekly seminar series as well as a Lineberger Cancer Research Center/Triangle Seminar Series with invited guest scientists of national and international reputation. In addition, the Center sponsors an annual Postdoctoral Fellow-Faculty retreat each fall, and a two-day cancer symposium each spring with presentations and workshops on a topic of interest to cancer scientists at UNC and the surrounding area. Workshops and minisymposia are also sponsored by the Lineberger Center on topics of current interest throughout the year.

Multipurpose Arthritis Center

Director: John B. Winfield, M.D. (Medicine)

Associate Director: Suzanne V. H. Sauter, M.D. (Medicine and Rehabilitation Program)

Assistant Director: Roberta Riportella, Ph.D. (Center for Health Promotion/Disease Prevention, and Social Medicine)

Co-Directors, Non-biomedical Research Component: Charles P. Friedman, Ph.D. (Family Medicine and OED) and Robert DeVellis, Ph.D. (Rehabilitation Program)

Associate Director, Non-biomedical Research Component: Joanne M. Jordan, M.D. (Medicine)

Co-Director, Biomedical Research Component: Gordon D. Ross, Ph.D. (Medicine)

Director, Numerical Sciences Core: John G. Fryer, Ph.D. (Biostatistics, School of Public Health)

In July 1982, the Multipurpose Arthritis Center was established through funding from the National Institutes of Health to conduct innovative research projects and programs in the field of arthritis. Scientists in the Biomedical Research Component are investigating basic immunologic questions relevant to the pathogenesis of autoimmune and systemic connective tissue disease. Clinical and epidemiologic research is ongoing in the areas of orthopedics, metabolic disease, and pediatric rheumatology. Education specialists in the Non-Biomedical Research Component include arthritis psychosocial research and model arthritis health care delivery, and intervention programs in outlying communities and in industry. The Immunology Core supports basic research through facilities for flow cytometry, hybridomas, T cell cloning, immuno-assays, and pathogen free inbred mouse colonies. The Numerical Science Core provides research design, data management and analysis, and other types of a whole to increase productivity and to accurately document and interpret the results of the various programs of research being carried out by the Multipurpose Arthritis Center.

Office of Continuing Medical Education

Director and Associate Dean for Continuing Medical Education and Alumni Affairs: William E. Easterling, M.D. (Obstetrics & Gynecology)

The Office of Continuing Medical Education (located in 231 MacNider) is responsible for the planning and administration of postgraduate education. The School of Medicine is accredited as an organization for continuing medical education by the Accreditation Council for Continuing Medical Education (ACCME). Education programs are accredited for general medical personnel and medical specialty groups, for Continuing Education Unit (CEU) credits, and other professional groups. These educational programs are located at The University of North Carolina at Chapel Hill, throughout North Carolina, as well as nationally, and are implemented through the cooperation of the School of Medicine faculty, Area Health Education Centers faculty and staff, and invited guests. Attendance is confirmed upon registration and is open to appropriate professional and professionally related persons on an equal opportunity basis.

Office of Educational Development

Professor and Director: Charles P. Friedman, Ph.D.

Clinical Assistant Professor and Associate Director: Allen C. Smith, III, Ph.D.

Professors: Henry T. Frierson, Ph.D.; William C. McGaghie, Ph.D.; Frank T. Stritter, Ph.D.

Clinical Assistant Professor: Jacqueline B. Beza, Ph.D.

Lecturer: Larry Keith, M.A.

Clinical Instructor: Ruth de Bliek, M.Ed.

Senior Associates: Evelyn B. McCarthy, M.A.; Donna H. Harward; W. Ashley Davis

The Office of Educational Development, previously the Office of Research and Development in the Health Professions-ORDEHP, is a resource to the faculty of the School of Medicine. It is an academic unit located within the Dean's office, established to support and enhance the School's educational mission. OED faculty and staff members collaborate with basic science and clinical faculty in such areas as curriculum, instruction, faculty and student development, and student and program evaluation. OED's focus includes undergraduate, graduate and continuing education in several of the health professions. The Laboratory for Computing and Cognition within OED gives increased emphasis to research and development around applications of information technology to education and clinical practice. OED annually offers the Medical Education Development Program for prospective medical and dental students. The Learning and Assessment Laboratory assists students in developing academic skills, and counsels students having academic difficulties.

OED's mission includes identification of areas where the process of education of health professionals can be studied and thereby improved. OED both initiates its own programs directed at such needs, and supports the programs of other faculty members, divisions, or departments. It collaborates with faculty working on grants and contracts which incorporate educational program development, implementation, and evaluation as a component. Drs. Friedman, Frierson, McGaghie and Stritter are jointly appointed in the School of Education and regularly offer graduate level courses there. OED is located in Room 322, CB 7530, MacNider Building, School of Medicine, University of North Carolina, Chapel Hill, NC 27599-7530 (919-966-3641).

Office of Information Systems

Director and Associate Dean for Information Systems: Kirk C. Aune, Ph.D. (kaune @ med.unc.edu)

Information Network Manager: Gerard Robinson (robinson @ med.unc.edu)

Educational Coordinator: Elizabeth A. Evans, M.S.L.S. (uevans @med.unc.edu)

Administrative Database Coordinator: Carol Ludwig (csl @med.unc.edu)

Clinical Database Coordinator: Ben Aycock (aycock @ med.unc.edu)

Academic Database Coordinator: Perry Derrenbacher (useaox @ med.unc.edu)

The Office of Information Systems (OIS) was established in September 1986. The organizational structure and goals were designed to: 1) establish and support a data communications network; 2) support and distribute an Administrative Management Information System (MIS) with fiscal, personnel and academic data; 3) create clinical databases; 4) provide computer power in support of research and education, and; 5) provide educational and training activities in support of users.

The components of the School of Medicine Information Network (SOMIN) are: 1) TCP/IP running on Ethernet; Unix workstations and file servers; 2) TCP/IP terminal servers to accommodate asynchronous communication devices such as PCs and terminals on the network; 3) gateways and bridges to accommodate PC LANs requiring SOMIN utilization, and; 4) a relational database management system, Ingres, for developing additional administrative and clinical databases.

The SOMIN is an Ethernet data communications network that stretches through the main buildings of the School of Medicine. Implementation of the network throughout all of the School continues.

In addition to providing the School access to local (OIS-managed) resources, the implementation of SOMIN also provides access to regional, national and global networks, as well as to other local (campus and state) networks.

The School of Medicine includes facilities remote to the contiguous School of Medicine/Hospital complex. Those facilities are connected to SOMIN through electronic bridges by way of the campus broadband cable. RF modems and IB1 interface units from 3-COM (Bridge Communications) bridge Ethernet protocol on the existing campus broadband cable by employing two 6MHz channels to support a bi-directional 5MB bandwidth.

Currently, OIS maintains and operates 2 MicroVAX IIs, 2 Sun 3/280s, 1 Sun 3/260, 1 Sun 4/280, 1 Sun 3/110, 1 Sun 386i and 40 Sun 3/50 Workstations along with 60 CS/200-10 terminal servers, and 2 Bridge network control servers. There are numerous other computers of a variety of brands connected to the network operated by various departments in the School. Most computers and terminal servers run under TCP/IP, except for a few VAX VMS systems and Pro350s which use DECNet.

OIS operates a Unix mail server and domain server for computers connected to SOMIN, which provides transparent mail transfer to BITNET sites and DEC mail sites, local and remote.

Other local resource available to SOMIN users include: Inquirer, a teaching tool application managed by the Laboratory for Computing and Cognition; dial-in and dial-out modems; a connection to the campus Sytek 2000 network; direct TCP/IP connections to ACSVAX (managed by the campus Academic Computing Services); and connections to other internet sites, local and global.

Applications available to users of OIS managed workstations include: EuGene (a DNA and protein sequence analysis system); SAS; Alis (an integrated package including desktop publishing, a calendaring system, a spreadsheet, a simple database manager, and a graphics editor); and Ingres for database development. The OIS also supports CLINFO running on RS/1 for the CRU in the School of Medicine, and PERLINE Serials control for the Health Sciences Library. All applications on the workstations are accessible either from a simple to use menu-driven interface, or from the C shell. Most users gain access to the family of workstations by way of connections from their PCs. In addition to the applications, the Office also supports a substantial FAX service for much of the School of Medicine.

Operationally, the Office is structured with coordinators supervising administrative, clinical and academic database development; with a coordinator for Educational Services; and with a manager of technology development and systems operations.

Office of International Affairs

Director: James W. Lea, Ph.D. (Family Medicine)

The Office of International Affairs was established in 1982 to enhance and facilitate international enterprises of medical faculty, residents and students, and to strengthen the international dimension of the School of Medicine. The Office provides planning and information assistance to faculty and students undertaking international research, study and service. It maintains an information database on current international activities of the School, develops and promotes new efforts and opportunities, coordinates with other campus entities involved in international affairs, and sponsors or co-sponsors educational or informational events for faculty and students. The Office of International Affairs is located at 208 and 210 North Columbia Street, Chapel Hill, NC.

Office of Medical Alumni Affairs

Director and Associate Dean for Continuing Medical Education and Alumni Affairs: William E. Easterling, M.D. (Obstetrics & Gynecology) (Appointed 1989), William B. Wood, M.D. (Medicine) (Resigned 1988)

Executive Assistant: Stephanie Stadler

Graduates of the UNC School of Medicine (both M.D. and basic science graduates), former housestaff of the University of North Carolina Hospitals, and faculty are automatically members of the UNC Medical Alumni Association. The Association meets annually in the spring and the fall, and holds other meetings through throughout the year. There are no membership dues. The Medical Alumni Association and the Office of Medical Alumni Affairs are in the midst of major new initiatives to support the alumni and the institution.

The *Medical Alumni Bulletin* is published on a quarterly basis and serves as a means of communicating with the alumni. This publication, several student scholarships, sponsored student activities, and other activities of the School and the Association are possible through contributions to the Medical Alumni Loyalty Fund. The Loyalty Fund is held in trust by the Office of Medical Alumni Affairs.

The Program in Molecular Biology and Biotechnology

Acting Director: Philip L. Carl, Ph.D. (Pharmacology) (Appointed 1989), Marshall H. Edgell, Ph.D. (Microbiology and Immunology) (Resigned 1989)

Workshop and Facilities Coordinator: Susan J. Kelly, Ph.D. (Biology)

The Program in Molecular Biology & Biotechnology was created in the Medical School in 1981. The Program was established to promote genetic engineering research and education at the University of North Carolina at Chapel Hill. This organization encompasses, however, faculty from the entire UNC-CH campus (College of Arts and Sciences, School of Public Health, and School of Medicine), and it serves as a focus for organizing academic activities which will accelerate the diffusion of molecular genetic technology into the research community.

Associated degree-granting units include: Biochemistry and Nutrition, Biology, Botany, Cell Biology and Anatomy, Chemistry, Genetics Curriculum, Medical Parasitology, Microbiology and Immunology, Neurobiology Curriculum, Pharmacology, and Physiology.

The Program presently sponsors three Carolina Conferences: Gene Transfer and Expression, and Protein Engineering which are held on an annual basis, and Molecular Neurobiology which is held semi-annually. The Carolina Workshops, intensive two to three week laboratory courses, are designed to give researchers intensive hands-on experience in DNA cloning and sequencing; they are held each semester and in the summer. The Program also sponsors a special interest group in Macromolecular Structure and partially supports various core facilities important for research and training in areas critical for biotechnology and molecular biology. Finally, the Program sponsors a program designed to bring promising undergraduate students to the University for a summer research program.

The Program on Aging

Director: Mark E. Williams, M.D. (Medicine)

Administrator: Sharon Womble

Coordinator of Clinical Services: Anne Flash, R.N., M.S.N.

Coordinator of Community Outreach: Betsy Giduz, M.S.W., M.S.R.A.

Coordinator of Educational Activities: Sasha Loring, M.Ed.

Coordinator of Research Development: Susan Gaylord, Ph.D.

Coordinator of Fellowship Program: Nancy Connolly, Ph.D.

The Program on Aging is dedicated to serving the older citizens of North Carolina. Its primary objective is to be a rich resource to the university, community, state and nation in the areas of education, research, and community outreach.

Established in 1979 as part of the University of North Carolina School of Medicine, the Program on Aging concentrates on: 1) development of geriatric leadership by providing advanced training to physicians and dentists through the geriatric fellowship program; 2) coordination of geriatric service by helping clinical departments in the School of Medicine develop and deliver comprehensive geriatric health care; 3) health education by providing up-to-date information to students, practicing professionals and the general public; 4) promotion of aging research by stimulating the development of new projects and supporting existing research efforts, and: 5) community outreach by consultation with policy makers, education of professionals and the general public, participation in the Area Health Education Centers, and collaboration with local nursing homes, retirement communities and home care services.

The Program on Aging supports faculty with an interest in geriatrics from the Departments of Medicine, Family Medicine, Epidemiology, Biostatistics, Psychiatry, and from the Schools of Dentistry and Social Work. In addition to Program staff there are numerous affiliates of the Program on Aging representing health professionals, scholars, and leaders throughout the State of North Carolina.

The Robert Wood Johnson Clinical Scholars Program

Co-Directors: Robert Fletcher, M.D. (Medicine), Gordon H. DeFriese, Ph.D. (Social Medicine)

The Robert Wood Johnson Clinical Scholars Program is a two-year fellowship for physicians who have completed clinical training and wish to pursue studies of the effectiveness and efficiency of health services, and how health care is organized and financed. Fellows broaden their understanding of health care through studies of epidemiology, biostatistics, social sciences, economics, management and the humanities. Many pursue advanced degrees, usually in the School of Public Health. Clinical Scholars continue to practice clinical medicine, and all are expected to complete research at the interface between clinical medicine and other disciplines. Following their fellowship, Clinical Scholars have taken research and leadership positions in academic medicine, government and the private sector. The University of North Carolina Clinical Scholars Program is one of six funded by the Robert Wood Johnson Foundation, Princeton, New Jersey.

Honors and Awards for the Years 1987–1988, 1988–1989, 1989–1990

STUDENT AWARDS

ALPHA OMEGA ALPHA HONOR MEDICAL SOCIETY

Class of 1987

Co-Presidents: Melissa Burch and Gustav Magrinat

David Bruce Baird*
William Stephen Blau*
Melissa Ward Burch*
James Belknap Collawn
Daniel Scott Fiddler*
Daniel Sommers Frank
Lee Anne Furlong*
Michael Lee Green
William Stuart Hartley
Richard Hratchia Havunjian*
Mark John Sherman Heath
Richard Page Hudson, III
Susan Foster Isbey
Constance Carpenter Jones*
William Walter King
Bret Alan Kort
Catherine Kuhn Lineberger*
Gustav Charles Magrinat*
Sherry Lynn Morris*
Douglas Alan Nelson
Rajiv Dhruvkumar Pandya
Mary Kay Washington

*elected junior year

Class of 1988

Co-Presidents: Michael Edward Lee, Richard Maurice Peek, Jr., Gail Elizabeth Quackenbush

Michelle Louise Bleynat
Jon Philip Brisley
James Blair Butler
Jeffrey Paul Campbell
Peter Gilbert Dalldorf
Margie Beazley Eason
Cynthia Marie Gregg
David Curtis Hillsgrove*
Jerry Dale Joines
Candace Williamson King*
Stephen Curtis King
Michael Edward Lee*
David Alan May
Charles Edward Parke
Richard Maurice Peek,Jr.*
Kathryn Elizabeth Phillips
Gail Elizabeth Quackenbush*
Jeffery Earl Roller
Theresa Anne Rupp*
Karen Gipson Seaton
John Robert Silver*
Spyro Peter Vulgaropulos*
Edward William Whitesides

*elected junior year

Class of 1989

Co-Presidents: Scott McKinley Baker and Robert Frederick Noel, Jr.

Lanier Hasty Ayscue
Scott McKinley Baker*
William Edward Cogburn
Amy Hurst Evans
Thomas Funcik
Patricia Hanna Gerr
Allen Lothrop Gifford*
Elizabeth Harris Hamilton*
Daniel Max Kaplan
William Lander Lawing
Laurel Kristin Leslie*
William Frederick McGuirt, Jr.
Gregory Francis Murphy
Robert Frederick Noel, Jr.*
Lisa Carolyn Richardson*
Arthur James Shepard, III*
Beat D. Steiner*
Todd Wilson Trask*
Frances Virginia White
Wendell Gray Yarbrough

*elected junior year

ALUMNI LOYALTY MERIT AWARDS

Class of 1987

Melissa Ward Burch
Daniel Sommers Frank

Class of 1988

Jon Philip Brisley
Jeffrey Paul Campbell

Class of 1989

Thomas Funcik
Allen Lothrop Gifford
Daniel Max Kaplan
William Lander Lawing
Laurel Kristin Leslie
William Frederick McGuirt, Jr.
Arthur James Shepard, III
Frances Virginia White

AMERICAN MEDICAL WOMEN'S ASSOCIATION AWARDS

Class of 1987

Melissa Ward Burch
Lee Anne Furlong
Susan Foster Isbey
Constance Carpenter Jones
Catherine Kuhn Lineberger
Sherry Lynn Morris
Mary Kay Washington

Class of 1988

Janet M. Glasgow Memorial Award

Candace Williamson King

Janet M. Glasgow Memorial Achievement Citation

Michelle Louise Bleynat
Margie Beazley Eason
Cynthia Marie Gregg
Gail Elizabeth Quackenbush
Kathryn Elizabeth Phillips
Theresa Anne Rupp
Karen Gipson Seaton

Class of 1989

Janet M. Glasgow Memorial Award

Laurel Kristin Leslie

Janet M. Glasgow Memorial Achievement Citation

Amy Hurst Evans
Patricia Hanna Gerr
Lisa Carolyn Richardson
Mary Denise Shearin
Frances Virginia White

THE W. R. BERRYHILL MERIT SCHOLARSHIP

Class of 1987

David Bruce Baird

Class of 1988

Candace Williamson King

Class of 1989

Todd Wilson Trask

BOARD OF GOVERNORS MEDICAL SCHOLARS

Class of 1989

Linda Mitchell-Frye
Fletcher Lee Gamble
Rosemary Jackson
Jacquelene Marie McIntyre
Lisa Carolyn Richardson
Melva Jeannette Richardson
Gary Wayne Roper
Yolanda Valjene Scarlett
Thomas Paul Walden

THE TERRI BRENNEMAN AWARD

Class of 1987

Elizabeth Anthony Harlan

Class of 1988

David Christopher Habel

Class of 1989

Virginia Johnston Barnhardt

THE JAMES BELL BULLITT AWARD

Class of 1987

Frances Owl-Smith

Class of 1988

David Alan May
Jeffrey Whitcomb Stolz

Class of 1989

Robin Lesette Ellett
Kathy Sue Robinson

THE CIBA-GEIGY AWARD

Class of 1989

Laurel Kristen Leslie 1987-1988

COMMONWEALTH FUND MEDICAL RESEARCH FELLOWSHIP

Class of 1987

Stephanie Elaine Spottswood

Class of 1988

Emmett Fitzgerald Steward

Class of 1989

Lisa Carolyn Richardson

GILBERT CUTHBERTSON AND MEGAN DANTON MEMORIAL AWARD

Class of 1989

Amy Hurst Evans

THE FRANK LEE DAMERON AWARD

Class of 1987

Charles Arthur Bolick (1985-86)
John Mark Bennett (1985-86)

Class of 1988

Jerry Dale Joines (1986-87)

Class of 1989

Donald Leland Ives (1987-88)

DOCTOR OF MEDICINE WITH DISTINCTION

Class of 1988

David Curtis Hillsgrove
Charles Edward Parke
Richard Maurice Peek, Jr.
Theresa Anne Rupp

Class of 1989

Laurel Kristin Leslie
Beat D. Steiner
Tood Wilson Trask

DOCTOR OF MEDICINE WITH HONORS

Class of 1987

Allen Williard Hamrick
Richard Hratchia Havunjian
Gustav Charles Magrinat
Mark Wilson Ochs
Henry Lawrence Shapiro

Class of 1988

Jeffrey P. Campbell
Maura Lynne Campbell
Anne Cunanan Ford
Asha Rosalind Kallianpur
Melinda Hill Privette
David Wintner Roberson
Karen Gipson Seaton
Mary Claire Skrzynski
Spyro Peter Vulgaropulos

Class of 1989

Lanier Hasty Ayscue
Amy Hurst Evans
Thomas Funcik
Robert Eric Hart
William L. Lawing
William Frederick McGuirt, Jr.
Christopher Dale McKinney
Tona Leigh Munday
Gregory Francis Murphy
Robert Frederick Noel, Jr.
Dean Priest Porter
Rick Paul Sessions
Arthur James Shepard, III
Gary Bradley Sherrill
John Patrick van Houten
Frances Virginia White
Jon Pointon Woods

DOCTOR OF MEDICINE WITH HONORS AND DISTINCTION

Class of 1988

David Alan May
Gail Elizabeth Quackenbush

Class of 1989

Allen Lothrop Gifford
Wendell Gray Yarbrough

FAMILY MEDICINE STUDENT AWARD

Class of 1989

Carol Ann Churchill

CHRISTOPHER C. FORDHAM AWARD

Class of 1989

Mary Frances Casey

THE HEUSNER PUPIL AWARD

Class of 1987 (1985–86)

Steven Howard Baker
Daniel Scott Fiddler
Lee Anne Furlong

Class of 1988 (1986–87)

Mary Elizabeth Froelich
John Robert Silver
Spyro Peter Vulgaropulos

Class of 1989 (1987-88)

Virginia Johnston Barnhardt
Amy Hurst Evans
Allen Lothrop Gifford
Arthur James Shepard, III

EDWARDS HOBGOOD DISTINGUISHED SCHOLAR

Class of 1989

Shannon Stewart Carson

HOWARD HOLDERNESS FELLOWSHIPS

Class of 1989

Paul Ethan Austin
Lanier Hasty Ayscue
Robert G. Elgin
Cherri Deserea Hobgood
William Lander Lawing
Christopher Dale McKinney
Rudolph Joseph Triana, Jr.
Forrest Sutton Whitaker

HENRY J. KAISER FAMILY FOUNDATION MERIT SCHOLAR

Class of 1989

Lisa Carolyn Richardson

DEBORAH C. LEARY AWARD

Class of 1987

Richard Hratchia Havunjian

Class of 1989

Wendell Gray Yarbrough

THE WILLIAM DeB. MACNIDER AWARD

Class of 1989

Laurel Kristin Leslie

ISAAC HALL MANNING AWARD

Class of 1987

Richard Hratchia Havunjian

Class of 1988

Gail Elizabeth Quackenbush

Class of 1989

Arthur James Shephard, III

MAP INTERNATIONAL FELLOWSHIP

Class of 1987

Daniel Scott Fiddler
Eve Garlington Spratt

DAVID A. MAYBERRY AWARD

Class of 1987

Philippa Ann Charlton

Class of 1988

Cynthia Marie Gregg
Toni Moody Long

Class of 1989

David Robert Williams, Jr.

MCGRAW HILL BOOK AWARD

Class of 1989

Todd Wilson Trask
Frances Virginia White

THE MEDICAL FACULTY AWARD

Class of 1987

Daniel Scott Fiddler

Class of 1988

Stanley Rudolph Watson

Class of 1989

Lisa Carolyn Richardson

THE MERCK MANUAL AWARDS

Class of 1987
May Yimei Huang
Charles Alan Ross
John Robinson Saltzman
Stephanie Elaine Spottswood

Class of 1988

Lisa Angelina Cooper
Marsden Hamilton McGuire
Althea Hill McPhail
Spyro Peter Volgaropulos

Class of 1989

Allen Lothrop Gifford
Robert Frederick Noel, Jr.
Beat D. Steiner

MERIT AWARDS

Class of 1987

David Bruce Baird
William Stephen Blau
Melissa Ward Burch
James Belknap Collawn
Daniel Scott Fiddler
Daniel Sommers Frank
Lee Anne Furlong
Michael Lee Greene
William Stuart Hartley
Richard Hratchia Havunjian
Constance Carpenter Jones
James Gregory Kaufmann
William Walter King
Sherry Lynn Morris
Mary Kay Washington

Class of 1988

Mary Elizabeth Aitken
Stephen Joseph Bickston
Michelle Louise Bleynat
Jon Philip Brisley
Jeffrey Paul Campbell
Maura Lynne Campbell
Anne Regina Cunanan
Peter Gilbert Dalldorf
Margie Beazley Eason
Mary Elizabeth Froelich
Cynthia Marie Gregg
Kirsten Marie Gross
David Christopher Habel
David Curtis Hillsgrove
Asha Rosalind Kallianpur
Candace Williamson King
Stephen Curtis King
Michael Edward Lee
David Alan May
Charles Edward Parke
Richard Maurice Peek, Jr.
Scott Miller Petty
Kathryn Elizabeth Phillips
Melinda Hill Privette
Gail Elizabeth Quackenbush
Theresa Anne Rupp
Karen Gipson Seaton
John Robert Silver
Spyro Peter Vulgaropulos
Edward William Whitesides

Class of 1989

Lanier Hasty Ayscue
Scott McKinley Baker
Virginia Johnston Barnhardt
Robert Wayne Beale
William Edward Cogburn
Amy Hurst Evans
Charles Joseph Forster
Thomas Funcik
Patricia Hanna Gerr
Allen Lothrop Gifford
Carol Elaine Golin
Robert Eric Hart
Ruth Landsberger Hazard
Yung-chieh Ho
Daniel Max Kaplan
Charles Gordon Lampley, IV
William Lander Lawing
Lisa Sykes Leland
Laurel Kristin Leslie
William Frederick McGuirt, Jr.
Gregory Francis Murphy
Duong Xuan Nguyen
Lisa Carolyn Richardson
Rebecca Margaret Ryder
Yolanda Valjene Scarlett
Rick Paul Sessions
Mary Elizabeth Sheehy
Arthur James Shepard, III
Gary Bradley Sherrill
Beat D. Steiner
Todd Wilson Trask
Frances Virginia White
Wendell Gray Yarbrough

THE RIGGINS MERIT SCHOLARSHIP

Class of 1989

Todd Wilson Trask

THE SANDOZ AWARD

Class of 1987

Gustav Charles Magrinat

Class of 1988

Theresa Ann Rupp

Class of 1989

Laurel Kristin Leslie

CECIL G. SHEPS AWARD IN SOCIAL MEDICINE

Class of 1989

Laurel Kristin Leslie

STUDENT RESEARCH DAY—MICHIKO KUNO AWARD

Wendell Gray Yarbrough
"Molecular Basis of Androgen Insensitivity in the *Tfm* Rat"

THE GEORGE C. THRASHER, JR. AWARD

Class of 1987

Daniel Sommers Frank

Class of 1988

Kathryn Elizabeth Phillips

Class of 1989

Laurel Kristin Leslie

THE UPJOHN AWARD

Class of 1987

Melissa Dara Moore

Class of 1988

Peter Gilbert Dalldorf

Class of 1989

Sarah Colman Klemmer

THE WOMACK-WHITSON FOUNDATION SCHOLARS

Class of 1988

Jerry Dale Joines
Samuel Thomas Sockwell

Class of 1989

William Randall Harris, IV
Beat D. Steiner

FACULTY AWARDS

HYMAN L. BATTLE DISTINGUISHED EXCELLENCE IN TEACHING

Roy C. Orlando, M.D. (1985–86)
Associate Professor of Medicine

Frederic B. Askin, M.D. (1986–87)
Professor of Pathology

David L. McIlwain, Ph.D. (in the Basic Sciences, 1987–88)
Professor of Physiology

Richard G. Azizkhan, M.D. (in the Clinical Sciences, 1987–88)
Assistant Professor of Surgery

BEST CLINICAL CLERKSHIP

Department of Medicine (1985–86)
David A. Ontjes, M.D., Professor and Chair

Department of Medicine (1986–87)
David A. Ontjes, M.D., Eunice Bernhard Distinguished Professor of Medicine and Chair

Department of Pediatrics (1987–88)
Thomas F. Boat, M.D., Professor and Chair

CCB EXCELLENCE IN TEACHING

Edith K. MacRae, Ph.D. (1985–86)
Professor of Cell Biology and Anatomy

James A. Bryan II, M.D. (1986–87)
Professor of Medicine and Social Medicine

Newton D. Fischer, M.D. (1987–88)
Thomas J. Dark Distinguished Professor of Surgery

DISTINGUISHED FACULTY AWARD

William Brevard Blythe, M.D. (1986–87)
Professor of Medicine

Floyd W. Denny, Jr., M.D. (1987–88)
Professor of Pediatrics and Medicine

James H. Scatliff, M.D. (1988–89)
Professor and Chair of Radiology

DISTINGUISHED SERVICE AWARDS

1986–87 Academic Year

Kenneth M. Brinkhous, M.D.
Thomas C. Butler, M.D.
Orville B. Campbell
Charles E. Hayworth
Jack Hughes, M.D.
Harry M. Meyer, Jr., M.D.
Paul L. Munson, Ph.D.
Bailey D. Webb, Ph.D., M.D.

1987–88 Academic Year

John W. Foust, M.D.
Earl Carwile LeRoy, M.D.
John K. Spitznagel, M.D.
Robert Zeppa, M.D.
Mr. I. B. Julian

1988–89 Academic Year

Noah H. Bennett, Jr.
William J. Cromartie, M.D.
Bryant L. Galusha, M.D.
John A. Kirkland, M.D.
David T. Tayloe, M.D.
D.J. Thurston, Jr.

HENRY C. FORDHAM AWARD

James Philip Evans, M.D., (1986–87, Resident in Medicine)

Peter Freebeck, M.D., (1987–88, Resident in Medicine)

Susan Kirk, M.D. (1988–89, Resident in Medicine)
Kimberly Kylstra, M.D. (1988–89, Resident in Medicine)

FRESHMAN BASIC SCIENCE COURSE AWARD

Department of Physiology (1985–86)
Edward R. Perl, M.D., Professor and Chair

Department of Physiology (1986–87)
Edward R. Perl, M.D., Sarah Graham Kenan Professor and Chair

Department of Physiology (1987–88)
David L. McIlwain, M.D., Professor of Physiology

FRESHMAN BASIC SCIENCE TEACHING AWARD

Philip Frederick Sparling, M.D. (1985–86)
Professor and Chair of Microbiology and Immunology

Gerry S. Oxford, Ph.D. (1986–87)
Associate Professor of Physiology

Noelle A. Granger, Ph.D. (1987–88)
Associate Professor of Cell Biology and Anatomy

KAISER-PERMANENTE EXCELLENCE IN TEACHING

Axalla J. Hoole, M.D. (1985–86)
Assistant Professor of Medicine

H. Shelton Earp, III, M.D. (1986–87)
Associate Professor of Medicine

Gerry S. Oxford, Ph.D. (1987–88)
Professor of Physiology

OUTSTANDING INTERN

Fidel Valea, M.D., (1985-86, Resident in Surgery)

Peter C. Freebeck, M.D., (1986–87, Resident in Medicine)
Jonathan S. Serody, M.D., (1986–87, Resident in Medicine)

Melisa D. Moore, M.D. (1987–88, Resident in Surgery)
Herbert C. Pfaff, M.D. (1987–88, Resident in Medicine)

PROFESSOR AWARD

Campbell McMillan, M.D. (1986–87)
Professor of Pediatrics

Henry R. Lesesne, M.D. (1987–88)
Associate Professor of Medicine

William P. Biggers, M.D. (1988–89)
Joseph Palmer Riddle Distinguished Professor of Surgery

SOPHOMORE BASIC SCIENCE COURSE AWARD

Department of Pathology (1985–86)
Joe W. Grisham, M.D., Professor and Chair

Endocrine System
H. Shelton Earp, III, M.D. (1986–87)
Associate Professor of Medicine and Pharmacology

Cardiovascular System
Park W. Willis, IV, M.D. (1987–88)
Associate Professor of Medicine and Pediatrics

SOPHOMORE BASIC SCIENCE TEACHING AWARD

Frederic G. Dalldorf, M.D. (1985–86)
Professor of Pathology

Frederic B. Askin, M.D. (1986–87)
Professor of Pathology

Park W. Willis, IV, M.D. (1987–88)
Associate Professor of Medicine and Pediatrics

WHITEHEAD LECTURER

Ernest Craige, M.D. (1985–86)
Henry A. Foscue Distinguished Professor of Cardiology

William N. P. Herbert, M.D. (1986–87)
Associate Professor of Obstetrics & Gynecology

Dennis W. Ross, M.D. (1987–88)
Associate Professor of Pathology and Medicine

DESCRIPTION OF AWARDS

Descriptions of merit scholarships are listed under the scholarship section of this publication.

Student Awards

Alpha Omega Alpha

The Gamma Chapter of North Carolina of Alpha Omega Alpha, national medical honor society, was installed at the University of North Carolina School of Medicine in June 1954. A small number of students in the junior and senior classes are eligible for election to membership. Selection is based upon high academic standing, moral character, and promise of future contribution to the field of medicine.

The Terri Brenneman Award

This award was established in memory of Terri Brenneman of the class of 1984 who died in the midst of her third year. Terri was a person of extraordinary faith and devotion, whose goal in medicine was to serve the underserved whom she perceived to be separated from the rest of society, not only by lack of money but by differences in culture and values. This award is, therefore, given to a member of the graduating class who has demonstrated a commitment to reach across these economic, cultural and value differences to better serve the underserved. A special faculty committee selects the recipient. In addition to receiving a plaque, the winner will select a charitable cause to which a small sum of money will be donated in their name from the Terri Brenneman Memorial Fund.

The James Bell Bullitt Award

The James Bell Bullitt Award, given for the first time in 1962, honors Dr. Bullitt, formerly Professor of Pathology, who was a member of the faculty of the School of Medicine from 1913 to 1947.

Consistent with the varied contributions of Dr. Bullitt to this School, the award bearing his name is flexible in purpose and provides an opportunity for recognizing unusual achievements or contributions by a member of the senior class.

The Ciba-Geigy Award

The CIBA Award, established in 1973, consists of a complete set of the Netter CIBA Medical Illustrations in seven volumes, and is given to the sophomore medical student who, in the opinion of the Awards Committee, has contributed most in the area of community service.

The Frank Lee Dameron Award

The Frank Lee Dameron Award was established by the Class of 1975 in memory of their classmate, in recognition both of his achievements as a medical student and of his commitment to return to his hometown in a medically deprived area of the state to practice medicine. The award is given to a member of the third year class who is a student in good standing, committed to practicing primary care medicine at the end of his or her training program in a rural or medically deprived area of the state. Selection by class ballot is directed by the vice-president of the senior class, with the assistance of a designated faculty member and the president of the Whitehead Society. The recipient is announced and the check is presented by the vice-president of the senior class at the annual Whitehead Lecture.

Distinguished Faculty Awards

The Medical Alumni Association established this award to be given each year beginning in 1978 to a full-time UNC faculty member for excellence in teaching, contributions to medicine in the state, leadership in continuing education of practicing physicians, and accomplishments in improving communications between faculty, alumni and people of the state.

Distinguished Service Award

This award was established in 1955, on the 75th anniversary of the founding of the Medical School, to recognize those who contributed importantly to the establishment and early growth of the four-year Medical School. The award was designed to honor alumni whose distinguished careers and unselfish contributions to society have added luster and prestige to the University and its Medical School.

Christopher C. Fordham Award

The Christopher C. Fordham Award was established in honor of Dr. Fordham for his outstanding and creative leadership in medical and higher education. He was a former Dean of the Medical School, Vice Chancellor for Health Affairs, and Chancellor of the University.

This award recognizes a graduating student for outstanding and creative leadership at the Medical School. Nominations for this award are solicited from each of the following groups: 1) the Chairs of the Departments based on their faculty's recommendations; 2) the members of the senior class, and; 3) senior class advisors.

Foreign Fellowships

The School of Medicine has a small number of fellowships available to pay for travel expenses, and furnish partial support for medical students who wish to have an elective clinical or research experience in another country. One of the fellowships is reserved each year for two students selected for a clinical experience at the Warwick Hospital in England. Students who wish to compete for one of the fellowships should submit a proposal to the Student Awards Committee, Office of Student Affairs, stating the type of experience desired, the foreign sponsors, dates and objectives, in terms of overall as well as specific goals.

The Heusner Pupil Award

This award was established in 1964 by friends of the late Dr. A. Price Heusner, who was Professor of Surgery from 1952-1956 and then Professor of Anatomy until his death in 1963. A special faculty committee selects the recipient, "...a member of the rising fourth-year class who shall show a great capacity to grasp the principles of science, to heal the sick, to comfort the troubled, and to be humble before God."

Judith Joklik Award

This award was established in 1975 by the family of Mrs. Judith Joklik. The purpose of the cash award is to recognize an outstanding contribution in the field of cancer research by a medical student. The recipient will be chosen by a faculty committee which judges papers submitted for consideration in the Medical School Student Research Paper Program. The award is not necessarily given annually, but serves to recognize a truly outstanding contribution in this area.

The Michiko Kuno Research Award

The Michiko Kuno Research Award was established in 1975 in honor of the late Mrs. Michiko Kuno, wife of Dr. Motoy Kuno, Professor of Physiology. The cash award is given to the student whose research paper and presentation at the annual Student Research Day is judged best by a student and faculty committee.

The Deborah Cushing Leary Award

The Deborah Cushing Leary Award was established in 1958 in honor of the late Dr. Deborah Cushing Leary, Associate Professor of Obstetrics and Gynecology at the University of North Carolina School of Medicine for the period 1952-1957. This award is given to the student whose paper is judged by a faculty committee to be the best paper submitted for consideration in the Medical School Student Research Paper Program.

The William deB. MacNider Award

The William deB. MacNider Award was established by the second year class of 1950, and consists of public commendation of a sophomore medical student who is elected by his/her classmates, because he/she possesses various intangible traits of good character which were typified by Dr. 'Billy' MacNider during his fifty-one years as teacher and physician at the University of North Carolina at Chapel Hill. A plaque hangs in MacNider Building and is inscribed each year with the name of the recipient.

The Isaac Hall Manning Award

The Isaac Hall Manning Trust Fund was established in 1954 by an anonymous donor to honor Dr. Isaac Hall Manning, formerly Professor of Physiology and for many years Dean of the School; his service to the School was continuous from 1905 to 1936. The fund will provide an annual award to the member of the graduating class, whom the Dean and the medical faculty may deem especially worthy of honor.

The David A. Mayberry Award

The David A. Mayberry Award is given at the time of graduation to a student of the School of Medicine of the University of North Carolina who, during any period of clinical training within the Department of Pediatrics, has demonstrated exceptional human qualities and clinical scholarship in the care of children with cancer. A special faculty committee selects the recipient.

The Medical Faculty Award

The Medical Faculty Award, established in 1971, is given to the graduating senior who has, in the opinion of the medical faculty, contributed in an outstanding way as a student, scholar, and member of this medical community. Nominations are made, and funds contributed by the faculty. Contributions in excess of the $100.00 award are given to the Student Aid Fund in the Dean's Office.

The Merck Awards

The Merck Awards are presented annually by Merck and Company to four students judged by a faculty committee to be deserving of recognition. The award consists of manuals engraved with the names of the recipients.

The C.V. Mosby Company Book Awards

The C.V. Mosby Company Book Awards are presented annually by the Mosby Publishing Company. These awards consist of the presentation of a current medical book to three outstanding students in the School of Medicine.

The Sandoz Award

The Sandoz Award, established by Sandoz, Inc. in 1975, is given to a fourth year medical student in recognition of superior academic achievement and contribution to health care. The award consists of a check and an engraved plaque.

Cecil G. Sheps Award in Social Medicine

This award was established in 1987 in honor of Dr. Cecil G. Sheps, Distinguished Professor Emeritus of the Department of Social Medicine at the University of North Carolina School of Medicine. The award is given to a fourth year medical student who demonstrates academic excellence and practical commitment to the principles of social medicine throughout the four years of undergraduate medical school. Academic excellence is judged by the performance of the student in the course offerings in social medicine, while practical commitment may be demonstrated either by student involvement in a research project which seeks to extend the understanding of an aspect of social medicine, or by clinical work which promotes the application of social medicine principles. Selection is performed by faculty committee.

The George C. Thrasher, Jr. Award

The George C. Thrasher, Jr., Award was established in 1965 by the Department of Psychiatry to be "...given annually to that member of the graduating class who, during his or her medical school experience, shows the most outstanding performance and ability in psychiatry." A special committee in the Department of Psychiatry will select a student for recommendation to the faculty committee on awards.

The Upjohn Award

In 1969 the Upjohn Company established an award to permit the recognition of a graduating senior. The award consists of a check and an engraved plaque. The recipient is selected for distinguished service in student affairs.

Faculty Awards

The Battle Distinguished Excellence in Teaching Award

This award was established in 1985 for excellence in teaching. Faculty are nominated by departments and students, and the recipient is selected by a vote of the student body. This award is presented at the annual Whitehead Lecture.

The Best Clinical Clerkship

This award was established in 1985 to recognize the clinical clerkship which contributed the most to the education of third year medical students. This award is presented at the annual Whitehead Lecture.

The CCB Excellence in Teaching Award

This award was established in 1973 for excellence in teaching. Faculty are nominated by departments and students, and the recipient is selected by a vote of the student body. This award is presented at the annual Whitehead Lecture.

The Henry C. Fordham Award

This award was established by the Senior Class of 1958 in honor of the late Dr. Henry C. Fordham, Resident in Medicine at the North Carolina Memorial Hospital 1957–1958. The seniors grant this award annually to a member of the housestaff "...in recognition of the qualities of patience, humility, and devotion to medicine as were possessed by Dr. Fordham."

Freshman Basic Science Course Award

This award was established in 1985 to recognize a course in the first year basic sciences that was effectively organized, skillfully taught and contributed the most to the education of first year medical students. This award is presented at the annual Whitehead Lecture.

Freshman Basic Science Teaching Award

This award was established in 1985 to recognize a faculty member from the medical basic sciences who has contributed in a particularly effective and devoted manner to the education of first year medical students. This award is presented at the annual Whitehead Lecture.

The Outstanding Intern Award

In 1963 the junior class selected the intern who had been most helpful to their class and presented the intern with a book in the intern's specialty. Subsequent classes have continued this practice.

The Kaiser-Permanente Excellence in Teaching Award

This award was established in 1985 for excellence in teaching. Faculty are nominated by departments and students, and the recipient is selected by a vote of the student body. This award is presented at the annual Whitehead Lecture.

The Professor Award

"The Professor" Award was established by the Senior Class of 1956. Each recipient receives an individual engraved plaque, which is presented at the Senior Awards Ceremony. The inscription of the plaque reads: "This award is presented annually by the graduating class of The University of North Carolina School of Medicine to that faculty member who by his willingness, understanding, and ability has contributed most to our medical education."

Sophomore Basic Science Course Award

This award was established in 1985 to recognize a course in the second year basic sciences that was effectively organized, skillfully taught and contributed the most to the education of second year medical students. This award is presented at the annual Whitehead Lecture.

Sophomore Basic Science Teaching Award

This award was established in 1965 by the Sophomore Class to recognize a faculty member from the medical basic sciences who has contributed in a particularly effective and devoted manner to the education of second year medical students. This award is presented at the annual Whitehead Lecture.

The Whitehead Lecturer

A certificate is given in recognition of distinguished contribution to the science and art of medicine, and hereby designates the recipient an Honorary Member of the Whitehead Society on the occasion of the 1986 Richard H. Whitehead Lecture.

The Student Roster[1]

FIRST YEAR CLASS

Ahmad Jafar Ali, University of University of North Carolina at Chapel Hill, B.S., 1987

Geoffrey Abbott Allen, Duke University, B.S., 1983

John Scott Aman, North Carolina State University, B.S., 1987

Marshall Wilson Anderson, Elon College, B.A., 1989

Ruric Clesby Anderson, University of University of North Carolina at Chapel Hill, B.A., 1989

Robert Fairburn Armstrong, Duke University, B.A., 1989

Grace Thompson Ayscue, Princeton University, B.A., 1982

Jeffrey Dean Babb, Duke University, B.H., 1988

Laura Susan Barlow, Duke University, B.S., 1989

Randal Paul Bast, Davidson College, B.S., 1988

Susan Marie Beck, Bennington College, B.A., 1983

Helen Rose Bellar, University of University of North Carolina at Chapel Hill, B.A., 1981

Paul Scott Bennett, University of University of North Carolina at Chapel Hill, B.S., 1989

Alfred James Beyer, Duke University, B.A., 1989

Michael Christopher Blake, Davidson College, B.S., 1984

Tony Oliver Blue, University of University of North Carolina at Chapel Hill, B.S., 1989

Mark Leonard Boles, High Point College, B.S., 1989

Robin Patton Bowers, Duke University, B.S., 1985

Catherine Bryan Bowman, Davidson College, B.S., 1988

Eric Speir Bradford, Davidson College, B.A., 1986

Rochelle Monique Brandon, University of North Carolina at Chapel Hill, B.A., 1988

Charles Fitzgerald Bratton, Davidson College, B.S., 1989

Terrence Dean Brayboy, University of North Carolina at Chapel Hill, B.A., 1986

Erin Elizabeth Brewer, University of the South, B.S., 1982

Jane Helen Brice, University of North Carolina at Chapel Hill, B.A., 1979

Brian Eugene Brigman, University of North Carolina at Chapel Hill, B.A., 1989

Harry Lee Broome, Davidson College, B.A., 1989

Justin Johngold Broughton, Davidson College, B.A., 1989

Minnie Marilyn Brown, Spelman College, B.S., 1980

Edward Charles Brown, III, Johns Hopkins University, B.S., 1985

Lesley Millican Burkhead, North Carolina State University, B.S., 1988

---

[1] First, Second and Third Year Classes for the 1989–90 Academic Year

Paul Leach Burroughs, University of North Carolina at Chapel Hill, B.S., 1989
Marlene Sayoc Calderon, University of North Carolina at Chapel Hill, B.A., 1988
Wendi Mehler Carlton, East Carolina University, B.S., 1987
Leigh Ann Carris, Duke University, B.S., 1989
John Stanley Chase, University of North Carolina at Chapel Hill, B.A., 1989
Stephen Daniel Ciesielski, Towson State University, B.S., 1977
Adrienne Charles Classen, Wellesley College, B.A., 1989
Clarence Coolidge Coleman, University of North Carolina at Chapel Hill, B.S., 1989
John Daniel Corey, University of Delaware, B.A., 1978
Charles Austin Corley, Saint Andrews Presbyterian College, B.S., 1989
Darrell Glenn Coston, Fairleigh Dickinson University, B.S., 1977
Cynthia Mary Cowan, University of North Carolina at Chapel Hill, B.A., 1986
William Lewis Craig, III, University of North Carolina at Chapel Hill, B.A., 1989
Carolyn Jo Dalldorf, George Washington University, B.A., 1988
Charles Barton Davis, University of North Carolina at Chapel Hill, B.A., 1986
Karla Lynn de Beck, Davidson College, B.S., 1989
Cathy Ann Donovan, University of Miami, B.S., 1989
Therese Marie Durkin, East Carolina University, B.S., 1986
Michael Stewart Eggert, Duke University, B.A., 1989
Thomas Leon Ellis, Duke University, B.S., 1984
Mark Delacruz Estrada, Duke University, B.S., 1986
Warachal Eileen Faison, North Carolina Central University, B.S., 1989
Yvonne Yvette Fenner, Tougaloo College, B.S., 1977
Charles Byron Fooe, University of North Carolina at Chapel Hill, B.A., 1989
Patrick Louis Fry, University of North Carolina at Chapel Hill, B.S., 1988
Ben Thomas Furman, Wheaton College, B.S., 1989
Charles Michael Gammon, North Carolina State University, B.S., 1974
Sher Lynn Gardner, University of North Carolina at Chapel Hill, B.S., 1988
George Waldon Garriss, Asbury College, B.S., 1981
John Arthur Garside, University of Notre Dame, B.S., 1987
John Garabed Giragos, University of North Carolina at Chapel Hill, B.A., 1989
Cole Blease Graham, III, Duke University, B.S., 1988
James Judd Green, Dartmouth College, B.A., 1989
Thomas Matthews Haizlip, University of North Carolina at Chapel Hill, B.A., 1989
Andrew Foster Hall, Brown University, B.S., 1986
Walter Howard Hall, Saint Andrews Presbyterian College, B.S., 1989
Stacy Lynn Harper, University of North Carolina at Chapel Hill, B.A., 1989
Jennepher Nancy Hart, Wake Forest University, B.S., 1987

John Christian Hartmann, Hampshire College, B.A., 1981
Joseph Irvin Harwell, University of North Carolina at Chapel Hill, B.S., 1985
Raymond Charles Hausch, University of Arizona, B.A., 1984
Sandra Carolyn Haynes, Jersey City State College, B.S., 1987
Kenny Dewayne Hefner, Duke University, B.A., 1989
Marion McBride Herring, Washington and Lee University, B.S., 1989
Paul Wesley Hofferbert, Davidson College, B.A., 1988
Cynthia Heather Holmes, Duke University, B.S., 1988
Angela Maria Hopkins, University of Maryland, B.S., 1989
Harvette Jenkins Howell, North Carolina State University, B.S., 1985
Kuangzoo Samuel Huang, The State University at Rutgers, B.S., 1986
Monic Jain, University of North Carolina at Chapel Hill, B.S., 1987
Lauren Patricia Johnson, North Carolina State University, B.S., 1989
Terry Gail Kaplan, Smith College, B.A., 1988
Dean Harry Karras, University of North Carolina at Chapel Hill, B.S., 1989
Loretta Renee Kaus, North Carolina State University, B.S., 1986
Kenneth David Kessler, University of North Carolina at Chapel Hill, B.S., 1989
Cholwoo Anthony Kim, University of North Carolina at Chapel Hill, B.A., 1989
Tong Sun Kobilka, University of Minnesota at Duluth, B.S., 1976
Deborah Hull Ladd, University of North Carolina at Chapel Hill, B.A., 1986
Sherry Leigh Lauritzen, University of North Carolina at Chapel Hill, B.S., 1987
Susan Ann Lawrence, University of North Carolina at Wilmington, B.A., 1989
Alan Joseph Leininger, Ohio State University, B.S., 1985
Robert Pressman Lemmon, University of North Carolina at Chapel Hill, B.A., 1989
Laura Stallworth Lenholt, Goddard College, B.A., 1982
Edward Carwile Leroy, Jr., University of North Carolina at Chapel Hill, B.A., 1988
David Scott Leslie, Brandeis University, B.A., 1982
Joyce Rochelle Lewis, Spelman College, B.S., 1989
Steven John Lewis, University of North Carolina at Chapel Hill, B.S., 1989
Adam David Lowenstein, University of Wisconsin at Madison, B.S., 1989
Lisa Lynne Lucas, Princeton University, B.A., 1989
David Thomas May, University of North Carolina at Chapel Hill, B.A., 1989
Eugene Harold Maynard, University of North Carolina at Chapel Hill, B.S., 1988
Richelle Lynn McDaniel, University of North Carolina at Chapel Hill, B.A., 1989
Richard David McFarland, University of North Carolina at Chapel Hill, B.S., 1983
Teressa Yvette McKoy, University of North Carolina at Chapel Hill, B.S., 1989
Jennifer Lee Miles, Princeton University, B.A., 1984
Susan Rupp Mims, University of Georgia, B.S., 1988

Michelle Jeanine Moore, North Carolina Central University, B.S., 1989
Margaret Reiner Morris, Mount Holyoke College, B.A., 1967
Joseph Cole Mueller, University of Notre Dame, B.S., 1989
John David Norris, North Carolina State University, B.S., 1987
Claes Erik Michael Oldenburg, Wake Forest University, B.S., 1988
Karl Howard Olson, Earlham College, B.A., 1972
Lisa Michelle Owens, Brown University, B.A., 1989
Ameesha Jayantilal Pandya, Davidson College, B.A., 1989
Vijay Manu Patel, University of North Carolina at Chapel Hill, B.A., 1989
Carolyn Patricia Pearsall, North Carolina State University, B.A., 1988
John Dickson Phipps, University of North Carolina at Chapel Hill, B.A., 1989
Edward Munyan Pickens, University of North Carolina at Chapel Hill, B.S., 1989
John Bernard Piecyk, University of Notre Dame, B.S., 1989
Karen Kristine Poulos, University of North Carolina at Chapel Hill, B.A., 1988
Sandeep Rn Rahangdale, University of Pittsburgh, B.H., 1989
Lawrence Merial Raines, University of North Carolina at Chapel Hill, B.A., 1984
Victor F. Randolph, University of North Carolina at Chapel Hill, B.S., 1989
Anthony David Realini, University of North Carolina at Chapel Hill, B.S., 1989
Blair Vernon Robinson, North Carolina State University, B.S., 1989
Donald Roderick Rose, Jr., University of North Carolina at Chapel Hill, B.S., 1988
Kirby Lamont Saunders, North Carolina State University, B.S., 1989
Howard Ian Savage, Princeton University, B.A., 1987
John William Schaberg, North Carolina State University, B.S., 1989
Scott Neil Schwirck, University of North Carolina at Chapel Hill, B.S., 1989
David Richard Shaffer, University of Tulsa, B.A., 1976
Sunjay Arvind Shah, University of North Carolina at Chapel Hill, B.A., 1989
Tushar Nandlal Shah, University of Pennsylvania, B.A., 1988
Kenneth Leslie Shauger, Duke University, B.S., 1989
Jennifer Eloise Shook, Kutztown University of Pennsylvania, B.S., 1977
Virginia Irana Simnad, State University of California at San Diego, B.A., 1983
Patrick Joseph Simpson, University of North Carolina at Chapel Hill, B.S., 1989
Ellison Leon Smith, Furman University, B.A., 1989
Tammy Rose Spear, University of North Carolina at Greensboro, B.A., 1988
Lindo Terry Spencer, University of North Carolina at Chapel Hill, B.S., 1987
Lucy Ellen Spragins, Davidson College, B.A., 1988
Ricky Eugene Stallings, University of North Carolina at Chapel Hill, B.S., 1982
James Sanford Steadman, University of Connecticut, B.S., 1977
Eric Steven Stem, University of North Carolina at Chapel Hill, B.A., 1989

Holly Ann Stevens, Duke University, B.S., 1986
Christopher Jaffa Summers, Elon College, B.A., 1988
Carolyn Lee Taylor, University of North Carolina at Chapel Hill, B.S., 1989
Melinda Catherine Taylor, Duke University, B.S., 1989
Charles Burton Teague, University of North Carolina at Chapel Hill, B.A., 1989
Rebecca Brown Tobin, University of North Carolina at Chapel Hill, B.A., 1987
Paige Catherine Walend, Tulane University, B.A., 1989
Court Carroll Walters, Williams College, B.A., 1972
Wendy Kay Waters, Stephen F. Austin State University, B.A., 1980
Brian Richard Webster, Catholic University of America, B.S., 1989
David Alexander Wells, University of North Carolina at Chapel Hill, B.S., 1987
William Randal Westerkam, Duke University, B.S., 1987
Mary Katherine White, East Carolina University, B.S., 1988
Eric Anders Whitsel, University of North Carolina at Chapel Hill, B.S., 1986
Alexander Macleod Wilgus, Massachusetts Institute of Technology, B.S., 1980
Matthew John Wills, University of North Carolina at Chapel Hill, B.S., 1989
Jeffrey Lewis Wolfson, North Carolina State University, B.S., 1989
Tamara Jean Woods, Wofford College, B.S., 1988
Kirk Lyle Woosley, Baylor University, B.S., 1988
Jill Catherine Wright, Duke University, B.S., 1989
Julie Lamar Wynne, Duke University, B.A., 1984
Kathryn Anne Yung, Appalachian State University, B.A., 1989
David Paul Zarzar, University of North Carolina at Chapel Hill, B.A., 1987
Carlton Jude Zdanski, North Carolina State University, B.S., 1988

SECOND YEAR CLASS

Mark Jeffrey Abrams, University of South Carolina, B.S., 1988
David Paul Adams, University of North Carolina at Chapel Hill, B.S., 1985
Angela Jeanette Allen, North Carolina State University, B.S., 1985
Jorge Anibal Allende, Jr., University of North Carolina at Chapel Hill, B.S., 1988
Helen Parker Atkinson, Duke University, B.A., 1987
Keith James Baugh, University of North Carolina at Asheville, B.S., 1987
Kathryn Dolecek Beattie, University of North Carolina at Chapel Hill, B.S., 1988
Natalie Anita Bennett, Bennett College, B.S., 1985
Richard Alan Bennett, Massachusetts Institute of Technology, B.S., 1976
Charles King Bibby Jr., B.A., 1984
Marcel Daniel Bingham, North Carolina State University, B.S., 1986
Mary Martha Bledsoe, Davidson College, B.A., 1986

David Samuel Blythe, University of North Carolina at Chapel Hill, B.A., 1985
Aleta Alyce Borrud, Smith College, B.A., 1978
Anthony David Bray, University of North Carolina at Chapel Hill, B.S., 1984
Lindsay Caldwell Bridges, Dartmouth College, B.A., 1987
John Carlos Brockington, University of North Carolina at Chapel Hill, B.A., 1987
Lisa Ann Brone, North Carolina State University, B.S., 1988
David Allen Browder, North Carolina State University, B.S., 1988
Jerry Lee Browne, University of Iowa, B.S., 1979
John Hinty Burton, University of North Carolina at Chapel Hill, B.A., 1987
Ruth Lee Bush, Cornell University, B.A., 1987
Sarah Catherine Canada, Duke University, B.S., 1988
Crystal Lynn Caudle, Salem College, B.S., 1988
Kalpana Vedavyasa Char, University of North Carolina at Chapel Hill, B.A., 1988
Jennifer Eisenmenger Charlton, University of North Carolina at Chapel Hill, B.S., 1981
Pamela Faye Cheung, Saint Andrews Presbyterian College, B.S., 1985
Nancy Carol Clayton, University of North Carolina at Chapel Hill, B.A., 1987
Thomas Robert Comerci, Duke University, B.S., 1985
Neil Allen Conti, University of North Carolina at Chapel Hill, B.S., 1988
Gerald Earl Cooley, Wheaton College, B.S., 1987
Lisa Ware Corbin, University of North Carolina at Chapel Hill, B.S., 1988
Christopher Church Cosgrove, University of North Carolina at Chapel Hill, B.A., 1988
Elizabeth Delpit Cressy, University of New Orleans, B.A., 1986
Cynthia Kay Crews, University of North Carolina at Chapel Hill, B.A., 1988
Carol Lynn Czop, North Carolina State University, B.S., 1983
Marisa Romilda D'Silva, Oberlin College, B.A., 1987
Dana Vanese Darien, University of Florida, B.S., 1988
Sarah Ellen Daughtridge, The State University at Rutgers, B.S., 1985
Gregory Ronald Davis, University of North Carolina at Chapel Hill, B.A., 1986
Victoria Kathleen Donovan, University of North Carolina at Chapel Hill, B.S., 1988
Yvette Renee Douglas, University of North Carolina at Chapel Hill, B.S., 1988
Holly A Dunn, Old Dominion University, B.S., 1988
Laura Burton Ellis, North Carolina State University, B.S., 1987
John Francis Ende, University of North Carolina at Chapel Hill, B.A., 1987
Sharon Marie Esposito, Allegheny College, B.A., 1970
Evan David Evans, East Carolina University, B.S., 1986
James Everett Jr., Wiley College, B.S., 1976
William Matthew Figlesthaler, Wake Forest University, B.A., 1987

Tamara Carol Fisher, University of North Carolina at Chapel Hill, B.S., 1985
Regina Fleming, State University of California at San Diego, B.A., 1983
Mary Joan Forbes, University of Notre Dame, B.H., 1984
Billie Jane Forehand, University of North Carolina at Chapel Hill, B.S., 1987
Vance Garrison Fowler II, Duke University, B.A., 1988
Juan Carlos Franco-Franco, University of North Carolina at Chapel Hill, B.S., 1988
Deborah Michele Gardner, Duke University, B.S., 1988
Elena Michelle Garris, University of North Carolina at Wilmington, B.A., 1987
Scott Keenan Garrison, University of North Carolina at Chapel Hill, B.A., 1988
David Randolph Gettes, University of Vermont, B.S., 1982
Patrick Lee Godwin Jr., Duke University, B.S., 1987
William Andrew Gramley, North Carolina State University, B.S., 1988
Lisa Marguerite Grana, Duke University, B.S., 1987
Willie Kent Guion, North Carolina State University, B.S., 1987
James Graham Hall, University of North Carolina at Chapel Hill, B.A., 1988
Willard Cardwell Harrill, University of North Carolina at Chapel Hill, B.A., 1988
John Thomas Harris, Duke University, B.A., 1987
Kenneth Jay Headen, Winston-Salem State University, B.S., 1982
Jane Timberlake Helwig, University of North Carolina at Chapel Hill, B.S., 1970
Halvor Warren Hem, IV, North Carolina State University, B.S., 1988
Laura Elizabeth Heyneman, Duke University, B.S., 1987
Linda Carla Hipp, North Carolina State University, B.S., 1986
Coty Phoung Hoat Ho, Wake Forest University, B.S., 1988
Lisa Hoekstra, Calvin College, B.S., 1987
James Bennett Holleman Jr., North Carolina State University, B.S., 1988
Sarah Smyth Hudgens, University of Florida, B.S., 1984
Frank Deklyn Huyler, IV, Williams College, B.A., 1987
Michael Isley, North Carolina Agricultural and Technical State University, B.S., 1987
Kenneth Lee Jacobs, Pembroke State University, B.S., 1988
Ronnie Lynn Jacobs, Pembroke State University, B.S., 1988
Mark Walter Jenison, University of North Carolina at Chapel Hill, B.A., 1987
Anthony Ethan Jenkins, High Point College, B.S., 1984
Pamela Cullie Jenkins, Duke University, B.S., 1983
Robert Ray Johnson, Jr., University of North Carolina at Chapel Hill, B.A., 1988
Rami Samir Kaldas, Duke University, B.S., 1988
Ayanna Ntianu Kambon, Tufts University, B.A., 1988
Cathryn Ann Kaylor, Oberlin College, B.A., 1982

Michael William Kendall, Duke University, B.A., 1988

Andy Christopher Kiser, University of North Carolina at Chapel Hill, B.S., 1988

David Aslan Konanc, Duke University, B.S., 1988

Todd Michael Kopczynski, University of North Carolina at Chapel Hill, B.S., 1987

Robert Wall Larkin, Jr., University of North Carolina at Chapel Hill, B.S., 1988

Robert Eric Larson, Duke University, B.S., 1986

Nancy Ann Leitch, Saint Olaf College, B.A., 1986

Thomas Craig Logan, Transylvania University, B.A., 1988

William Carlson Logan, Jr., University of North Carolina at Chapel Hill, B.A., 1988

William Edward Mangano, North Carolina State University, B.S., 1988

Joseph Angelo Mannino, Belmont Abbey College, B.S., 1988

Susan Rita Marcinkus, Duke University, B.H., 1983

Eileen Sharon Margolies, Duke University, B.A., 1987

Gordon Hunter Martin, University of North Carolina at Chapel Hill, B.S., 1988

Charles Richardson Martin, Jr., Davidson College, B.S., 1988

John Currie Mason, University of North Carolina at Chapel Hill, B.A., 1988

Jerry Franklin Matkins, Davidson College, B.S., 1988

Karen Fisher Mattocks, Bennett College, B.S., 1986

William Howard McAllister, IV, University of North Carolina at Chapel Hill, B.A., 1988

Kevin Gary McCowan, Morehouse College, B.S., 1986

Edward Christopher McGrath, Princeton University, B.A., 1985

Renee Brontae Melton, Saint Andrews Presbyterian College, B.S., 1988

Arlene Nichols Miller, Wake Forest University, B.S., 1987

Bobby Ray Miller Jr., State University of California at Stanislaus, B.A., 1983

Lanetta Bronte Mitchell, University of North Carolina at Chapel Hill, B.A., 1987

Veronica Denine Mitchell, Emory University, B.A., 1987

Jennifer Elaine Moore, University of North Carolina at Chapel Hill, B.S., 1988

Thomas Robert Moore, Davidson College, B.S., 1988

Walter Smith Morris, III, University of North Carolina at Chapel Hill, B.A., 1988

George Frederick Nelson, Howard University, B.S., 1987

Martin Tropper November, Duke University, B.A., 1986

Michael Garrett O'Reilly, University of North Carolina at Chapel Hill, B.A., 1984

Janice Ann Oliveri, Vassar College, B.A., 1986

Dipa Harish Patel, University of North Carolina at Chapel Hill, B.S., 1988

Nilesh Vithalbhai Patel, University of North Carolina at Chapel Hill, B.A., 1988

Preeti Vithalbhai Patel, University of North Carolina at Chapel Hill, B.A., 1987

George Howard Perkins, Wake Forest University, B.S., 1988

Jean Ellen Pratz, Duke University, B.S., 1986

Edward John Primka, III, Wake Forest University, B.S., 1988

Anthony Mark Propst, U.S. Air Force Academy, B.S., 1988

Anand Venkateswar Ramanathan, University of North Carolina at Chapel Hill, B.S., 1988

Dipak Jaysukh Ranparia, University of North Carolina at Chapel Hill, B.A., 1988

Robert Brian Raybon, North Carolina State University, B.S., 1988

Amulya Madhavi Reddy, Duke University, B.S., 1986

Sheley Rene Revis, Davidson College, B.S., 1987

Victoria Louise Rink, State University of California at Berkeley, B.A., 1983

Chinda Hopkins Roach, University of Rochester, B.A., 1988

Derrick Llewellyn Robinson, Texas A & M University, B.S., 1988

Hans Peter Roethling, University of North Carolina at Chapel Hill, B.A., 1988

Lisa Diane Rohde, University of Pennsylvania, B.S., 1979

Stephen Eisenhard Ross, Duke University, B.S., 1986

Lynda Lorraine Rozas, University of Maryland, B.A., 1988

John Cullen Ruff, Duke University, B.A., 1987

Carole Caldwell Sawicki, University of Cincinnati, B.S., 1964

Erika Anu Schmidt, University of North Carolina at Chapel Hill, B.A., 1988

Virginia Jeanette Schreiner, University of North Carolina at Chapel Hill, B.S., 1985

Randolph Phillip Sellers, Davidson College, B.S., 1982

Arlene Carmela Sena, University of North Carolina at Chapel Hill, B.S., 1987

Jon Wesley Serling-Boyd, Yale University, B.A., 1985

Kathleen Mary Shapley-Quinn, Kalamazoo College, B.A., 1985

Norman Edward Sharpless, University of North Carolina at Chapel Hill, B.S., 1988

David Hyosup Song, University of North Carolina at Chapel Hill, B.A., 1988

Derek Lynn Stirewalt, Davidson College, B.S., 1988

Christopher Wayne Sturbaum, Colorado State University, B.S., 1986

Anjali Mittra Sues, University of Illinois at Urbana, B.H., 1981

Thor Owen Svendsen, University of Cincinnati, B.H., 1985

James Edward Taylor, II, University of North Carolina at Chapel Hill, B.A., 1987

Theodore Tellef Thompson, State University of New York at Albany, B.S., 1981

Marion Dennis Thorpe, Jr., Duke University, B.S., 1986

Stephen Lloyd Tilley, University of North Carolina at Chapel Hill, B.A., 1988

Rita Elizabeth Treanor, Appalachian State University, B.A., 1984

Lisa Anne Tumey, University of North Carolina at Chapel Hill, B.S., 1988

Gregory Turner, University of Dayton, B.S., 1986

Marc Antoine Louis Vala, Duke University, B.A., 1988

Vernon Vines, University of North Carolina at Chapel Hill, B.A., 1986
Deborah Lynn Waldes, Lehigh University, B.A., 1974
Lisa Lynn Wang, Washington University, B.S., 1988
Johnny Clayton Weeks, III, North Carolina State University, B.S., 1988
Charles Duane Wells, North Carolina State University, B.S., 1987
Clifford Roberts Wheeless, Princeton University, B.S., 1988
Susan Jolene Whitney, Ball State University, B.S., 1988
Davette Wagner Williams, University of North Carolina at Greensboro, B.A., 1985
John Polk Williams, Duke University, B.S., 1988
James William Wilson, Jr., University of North Carolina at Chapel Hill, B.A., 1987
Kim Chree Windley, University of North Carolina at Chapel Hill, B.S., 1988
Bradford Tracy Winslow, Dartmouth College, B.A., 1988
Karen Suzanne Wood, Vanderbilt University, B.S., 1985
Nancy Law Wood, University of Kentucky, B.H., 1985
Tony Marrone Wright, Davidson College, B.S., 1988
Peter Russell Young, Jr., University of North Carolina at Chapel Hill, B.S., 1986
William Vancleef Yount, Duke University, B.S., 1987

THIRD YEAR CLASS

James Talat Al Hussaini, University of North Carolina at Chapel Hill, B.S., 1987
Carrie Deener Alspaugh, University of North Carolina at Chapel Hill, B.A., 1987
Patrick Kofi Amartey, B.S., 1980
Mark Alfred Anderson, Franklin and Marshall College, B.A., 1983
Katrina Howard Avery, University of North Carolina at Chapel Hill, B.A., 1982
Philip Lee Baird, Davidson College, B.S., 1986
Mack Nathaniel Barnes, III, Wake Forest University, B.A., 1985
Vito Basile, University of North Carolina at Charlotte, B.S., 1984
Andrew Roland Baxter, University of North Carolina at Chapel Hill, B.S., 1987
Frederick C. Beddingfield, III, North Carolina State University, B.A., 1986
Billy Wayne Berry, Jr., University of North Carolina at Chapel Hill, B.A., 1986
Yvette Elaine Bessent, East Carolina University, B.S., 1986
Robert Michael Boerner, University of North Carolina at Chapel Hill, B.S., 1987
Elizabeth Leigh Bradley, Appalachian State University, B.S., 1987
Thalia Nannette Bratton, University of Arkansas at Pine Bluff, B.S., 1987
Robert Paul Bright, University of North Carolina at Chapel Hill, B.S., 1986
Fredrick Joel Brody, University of North Carolina at Chapel Hill, B.A., 1987
Robert Carson Brooks, Williams College, B.A., 1984
Nancy Elaine Broskie, Duke University, B.S., 1984

Richard James Brostrom, Jr., Viterbo College, B.S., 1984

Richard Wayne Browder, Davidson College, B.A., 1987

Clayton Hollingswort Bryan, University of North Carolina at Chapel Hill, B.A., 1986

Donald Thomas Buckner, Jr., North Carolina State University, B.A., 1987

Stephen Ben Burgess, University of North Carolina at Chapel Hill, B.S., 1987

Brian Beaumont Caffrey, University of Florida, B.S., 1970

Sandra Lynn Carter, University of North Carolina at Chapel Hill, B.S., 1981

Raynor Christopher Casey, University of North Carolina at Chapel Hill, B.A., 1985

Perry Alonzo Caviness, University of North Carolina at Greensboro, B.A., 1976

Yong Dae Chang, University of North Carolina at Charlotte, B.S., 1987

James Michael Coggin, Davidson College, B.S., 1974

Leslie Carol Cohen, Duke University, B.A., 1983

Thomas Ross Coleman, University of North Carolina at Greensboro, B.S., 1983

Laura Benecki Cooper, North Carolina State University, B.S., 1986

Trella Shevonne Cooper, Yale University, B.A., 1985

Larry Van-Thomas Crisco, Wake Forest University, B.S., 1986

William Walter Crone, Davidson College, B.S., 1985

Robert Mabry Dacus, IV, Furman University, B.S., 1987

Megan Maria Davies, Warren Wilson College, B.A., 1984

Amy Ann De Stefano, University of North Carolina at Chapel Hill, B.A., 1986

Margaret Elizabeth Denny, University of North Carolina at Chapel Hill, B.A., 1987

Jane Ellen Drenkhahn, University of North Carolina at Chapel Hill, B.A., 1987

Marian Tereasa Ebron, East Carolina University, B.S., 1986

Cynthia Neill Epperson, University of North Carolina at Chapel Hill, B.S., 1986

Douglas Henry Esposito, University of Rochester, B.S., 1984

Margaret Frederick Farmer, Bryn Mawr College, B.A., 1982

Angela Ferebee, University of North Carolina at Chapel Hill, B.S., 1984

Lisa Maria Figueroa, University of North Carolina at Greensboro, B.A., 1986

Catherine Murer Fischer, Salem College, B.A., 1986

Samuel Bryson Fleming, II, University of North Carolina at Chapel Hill, B.S., 1987

Anita Pardue Flick, North Carolina State University, B.S., 1986

Roy Devonne Flood, Jr., University of North Carolina at Chapel Hill, B.S., 1986

Samuel Clay Franklin, Jr., University of North Carolina at Chapel Hill, B.S., 1986

Brent William Geissinger, University of North Carolina at Chapel Hill, B.S., 1987

Deepak Ramchandra Gelot, Western Carolina University, B.S., 1982

William Theotis Ghee, University of North Carolina at Chapel Hill, B.A., 1985

Lisa Regina Gholston, Pembroke State University, B.S., 1985

Daniel Paul Gianturco, College of William and Mary, B.S., 1987
Elizabeth Barbee Gibbons, University of North Carolina at Chapel Hill, B.A., 1986
Robert Patten Goolsby, University of North Carolina at Chapel Hill, B.A., 1987
Catherine Mason Gordon, North Carolina State University, B.S., 1986
Douglas Kim Graham, Wake Forest University, B.S., 1987
Rhonda Yvette Gregory, Howard University, B.S., 1986
Christopher John Gunnell, University of Michigan at Ann Arbor, B.H., 1982
Jerry Steven Hale, University of North Carolina at Chapel Hill, B.A., 1986
Brian Hugh Hamilton, Davidson College, B.S., 1983
Robert Seals Hatch, University of North Carolina at Chapel Hill, B.S., 1986
Karla Renee Hauersperger, North Carolina State University, B.S., 1987
Amy Christine Heidenreich, University of Notre Dame, B.S., 1987
Stephanie Wolfe Heindel, University of North Carolina at Chapel Hill, B.S., 1987
Leon Walker Herndon, Jr., University of North Carolina at Chapel Hill, B.S., 1987
Stephen Robert Drago Hindes, University of North Carolina at Chapel Hill, B.S., 1986
Carol Lee Hubbard, Cornell University, B.A., 1985
Christopher Wade Hunt, University of North Carolina at Chapel Hill, B.A., 1987
William Barlow Inabnet, University of North Carolina at Chapel Hill, B.S., 1987
Ann Rhamy Johnson, University of North Carolina at Chapel Hill, B.A., 1975
Connie Phillips Jones, Wake Forest University, B.S., 1987
Patricia Ann Jones, University of Miami, B.S., 1981
Tul Kalayanamit, University of North Carolina at Chapel Hill, B.A., 1984
Sharon Theresa Kapeluk, Cornell University, B.S., 1977
Ron Lawrence Kaplan, Brown University, B.S., 1987
Seth Evan Katz, Duke University, B.S., 1987
Shareen Fay Buys Kelly, Calvin College, B.S., 1987
Wilson Evans Kemp, Jr., Duke University, B.A., 1984
Helene Pauline Keyzer, Davidson College, B.S., 1986
Antoine Boutros Khoury, North Carolina State University, B.S., 1986
William Perry Killam, Davidson College, B.S., 1987
Valerie Jean King, Lewis and Clark College, B.A., 1982
Carol Bea Kirschenbaum, Queens College, B.A., 1973
Barrett Tyler Kitch, University of North Carolina at Chapel Hill, B.A., 1987
Rita Ann Kostecke, University of North Carolina at Chapel Hill, B.S., 1986
Kenneth Rand Lamm, University of North Carolina at Chapel Hill, B.A., 1987
Esther Joo Lee, University of North Carolina at Chapel Hill, B.A., 1987
Susan Wai Kuan Lee, Duke University, B.S., 1987

Diane Sue Litke, University of North Carolina at Chapel Hill, B.A., 1986
Michael John Lucas, Case Western Reserve University, B.S., 1987
Constantine Gregory Marousis, State University of New York at Binghamton, B.A., 1986
Terri Regina Martin, University of North Carolina at Chapel Hill, B.S., 1987
Thomas Lee Mason, University of North Carolina at Chapel Hill, B.A., 1985
George Larry Maxwell, Jr., University of North Carolina at Wilmington, B.A., 1987
James Joseph McCarthy, University of Wisconsin at Madison, B.S., 1986
Todd Durant McDiarmid, University of North Carolina at Chapel Hill, B.S., 1987
Scott Ramsey McDuffie, Davidson College, B.S., 1987
Chapman Teague McQueen, University of North Carolina at Chapel Hill, B.S., 1987
Linda Lucile Meredith, University of North Carolina at Chapel Hill, B.A., 1973
Benjamin Keith Merritt, North Carolina State University, B.S., 1975
Jobe Coy Metts, III, University of North Carolina at Chapel Hill, B.S., 1987
Sandra Louise Miller, Berry College, B.S., 1981
Thomas Joseph Monaco, Jr., North Carolina State University, B.S., 1987
Drew Carl Monitto, University of North Carolina at Asheville, B.S., 1986
Angelia Lynn Moore, University of North Carolina at Chapel Hill, B.S., 1987
Richard Sulter Moore, Jr., University of North Carolina at Chapel Hill, B.S., 1987
Harold Moses, Jr., University of North Carolina at Chapel Hill, B.S., 1985
Julien Louise Naylor, University of Virginia, B.A., 1978
Jerry Dale Nix, University of North Carolina at Chapel Hill, B.A., 1987
Laura Huber Nutter, Hanover College, B.A., 1977
Laurie O'Daniel, University of North Carolina at Chapel Hill, B.S., 1987
Carroll Christopher Overton, University of North Carolina at Chapel Hill, B.A., 1987
Gary James Pace, College of William and Mary, B.S., 1979
Larry Randell Padgett, Jr., Brigham Young University, B.A., 1987
Paul Christopher Padyk, Muhlenberg College, B.S., 1982
Mark Randall Parson, Duke University, B.A., 1987
Vincent Craig Phillips, University of Cincinnati, B.H., 1976
Brian Erich Platz, Duke University, B.A., 1984
Richard John Pollard, Davidson College, B.S., 1987
Janet Susan Protiva, State University of California at Davis, B.S., 1986
Amy Jeanette Robbins, Duke University, B.S., 1986
Todd Allen Rogers, University of North Carolina at Chapel Hill, B.S., 1987
Kevin Randolph Rust, North Carolina State University, B.S., 1987
Kathryn Ann Schultz, Duke University, B.S., 1983
Tiffany Monique Scott, Princeton University, B.A., 1987

Richard Paul Shea, Jr., Davidson College, B.S., 1986

Danny Silver, University of North Carolina at Chapel Hill, B.S., 1986

Delora Ann Simons, University of North Carolina at Chapel Hill, B.A., 1987

Brian David Smith, University of North Carolina at Chapel Hill, B.S., 1987

David Lee Smith, University of North Carolina at Chapel Hill, B.A., 1979

Scott Victor Smith, University of North Carolina at Chapel Hill, B.S., 1986

Elton Travis Smith, Jr., University of North Carolina at Chapel Hill, B.S., 1987

Susan Smith Smyth, Mount Holyoke College, B.A., 1987

Michael Francis Soboeiro, University of North Carolina at Chapel Hill, B.S., 1987

Anil Kumar Sood, Davidson College, B.S., 1986

Mark Alan Spears, North Carolina State University, B.S., 1986

Charles Anthony Staley, University of North Carolina at Chapel Hill, B.S., 1986

Eric Raymond Steuer, Yale University, B.S., 1984

Benjamin David Sutker, University of North Carolina at Chapel Hill, B.S., 1987

Todd Fitzgerald Tanner, North Carolina State University, B.S., 1987

Marcella King Taylor, University of The South, B.A., 1987

Jill Ellen Thompson, University of North Carolina at Asheville, B.A., 1987

Parlyn Denise Thurman, North Carolina Agricultural and Technical State University, B.S., 1987

Paul Christopher Tobin, University of North Carolina at Chapel Hill, B.S., 1987

Richard Lee Toothman, University of Pennsylvania, B.S., 1987

Patricia Fowler Triplett, University of North Carolina at Chapel Hill, B.S., 1980

William Troy Turlington, IV, Davidson College, B.A., 1985

Gilbert Rivers Upchurch, Jr., University of North Carolina at Chapel Hill, B.A., 1983

Robert Cheatham Vogler, University of North Carolina at Chapel Hill, B.A., 1985

Andrew Brian Wallach, Duke University, B.A., 1987

Joseph Bradley Webster, East Carolina University, B.S., 1987

Frederick Michael Weeks, University of North Carolina at Chapel Hill, B.A., 1981

Susan Marie Weeks, Duke University, B.S., 1987

Emily Watkins Wharton, Duke University, B.S., 1985

Herbert Charles Whinna, University of North Carolina at Chapel Hill, B.S., 1983

Patrick Aloysius Wilson, Belmont Abbey College, B.S., 1986

Joseph Paul Woodard, Jr., University of North Carolina at Chapel Hill, B.A., 1987

Margaret Henry Woodbury, University of North Carolina at Chapel Hill, B.A., 1986

Edward Howard Wrenn, Dartmouth College, B.A., 1980

David Franklin Yandle, Jr., Pembroke State University, B.S., 1984

Sherri Arthur Zimmerman, University of North Carolina at Chapel Hill, B.A., 1987

Patricia Jaye Zurflieh, Duke University, B.A., 1984

FOURTH YEAR CLASS—CLASS OF 1990

Amina Ahmed, Duke University, B.S., 1986

Stanley Gayle Alexander, University of North Carolina at Chapel Hill, B.A., 1975

Michelle Irene Amaya, College of William and Mary, B.S., 1986

Teresa Trogdon Anderson, University of Colorado at Boulder, B.A., 1975

John Thomas Atkins, III, U.S. Military Academy, B.S., 1986

Nicolette Susan Balister, Duke University, B.S., 1984

Benita Faye Banks, University of North Carolina at Chapel Hill, B.A., 1986

James Bernard Barber, North Carolina Agricultural and Technical State University, B.S., 1978

John Eldridge Barkley, University of North Carolina at Chapel Hill, B.S., 1986

Ronnie Jay Barrier, University of North Carolina at Chapel Hill, B.S., 1986

Lynda Lorraine Basnight, University of North Carolina at Chapel Hill, B.A., 1979

Laurie Owen Beitz, Dartmouth College, B.A., 1985

Elizabeth Anne Bell, University of North Carolina at Chapel Hill, B.S., 1980

Robert Gary Berkenblit, State University of New York at Albany, B.S., 1986

Robert Mark Bernstein, University of Virginia, B.A., 1986

Anna Peacock Bettendorf, University of North Carolina at Greensboro, B.H., 1974

Williamson Z. Bradford, Williams College, B.A., 1984

Paul Bradley Brechtelsbauer, Davidson College, B.A., 1986

Cedric Marc Bright, Brown University, B.A., 1985

Virginia White Brighton, Princeton University, B.A., 1984

Brian Charles Brost, Davidson College, B.S., 1984

Betsy Ellen Brown, Southwestern University, B.A., 1975

Victor Marcial Caceres, University of North Carolina at Chapel Hill, B.A., 1985

Martyn John Cavallo, University of North Carolina at Chapel Hill, B.A., 1985

Shelley Janeece Chapman, Davidson College, B.S., 1986

Jean Michele Cherry, Meredith College, B.S., 1986

Scott Michael Cochrane, State University of California at Davis, B.S., 1974

Richard Francis Cody, Jr., University of North Carolina at Chapel Hill, B.A., 1986

Wendy Kathryn Coin, University of North Carolina at Chapel Hill, B.S., 1985

David Martin Cook, North Carolina State University, B.S., 1986

Robert Lewis Cook, University of North Carolina at Chapel Hill, B.S., 1986

Catherine Lambert Cooper, University of North Carolina at Chapel Hill, B.A., 1979

Stuart Leonard Cooper, Davidson College, B.A., 1986

Todd Shawl Cowdery, Davidson College, B.S., 1983

Edward Michael Cox, Jr., University of North Carolina at Chapel Hill, B.A., 1985

Catherine Givens Craver, Cornell University, B.A., 1978

Charles James Cummings, University of Virginia, B.A., 1986
Terri Wood Cummings, University of North Carolina at Chapel Hill, B.S., 1984
Julia Lynn Danek, Davidson College, B.S., 1986
Rebecca Jane Davison, Duke University, B.S., 1984
Jeffrey Richard Daw, North Carolina State University, B.A., 1986
William de Araujo, Wake Forest University, B.A., 1985
Barry Thomas DeGregorio, Duke University, B.A., 1979
Myra Jane Deese, Wake Forest University, B.A., 1985
Rupa Vinod Desai, University of North Carolina at Chapel Hill, B.S., 1985
Lianne Marie de Serres, University of North Carolina at Chapel Hill, B.S., 1986
Jeanne Isabelle Dickens, University of North Carolina at Greensboro, B.S., 1986
Jon Patrick Donnelly, University of North Carolina at Chapel Hill, B.A., 1986
Thomas William Downs, State University of California at Berkeley, B.S., 1984
William Harry Dribben, University of North Carolina at Wilmington, B.A., 1985
Dianne Carol Duffey, University of North Carolina at Chapel Hill, B.A., 1986
Crystal Lynn Duncan, University of Florida, B.S., 1986
Thomas Elliot Edwards, Jr., University of North Carolina at Chapel Hill, B.S., 1986
Robert Richard Ehinger, University of North Carolina at Chapel Hill, B.A., 1986
John W. C. Entwistle, III, University of North Carolina at Chapel Hill, B.S., 1986
Mary Isom Fatehi, Duke University, B.A., 1983
Vanessa Ann Fenner, University of Michigan at Ann Arbor, B.S., 1985
Kimberley Kristen Fox, Princeton University, B.A., 1986
Dianne Michele Freund, University of North Carolina at Chapel Hill, B.S., 1986
Phillip Andrew Fullwood, University of North Carolina at Chapel Hill, B.S., 1985
William Blake Garside, Jr., University of Notre Dame, B.A., 1986
Gary Steven Gartner, Duke University, B.A., 1984
Robert Milton Gay, Jr., University of North Carolina at Chapel Hill, B.A., 1986
Sonia Valita George, University of North Carolina at Chapel Hill, B.S., 1986
Joel Sexton Goodwin, II, University of North Carolina at Chapel Hill, B.A., 1984
Keith Evans Griffin, University of North Carolina at Chapel Hill, B.A., 1986
Judith Morin Gurley, University of North Carolina at Chapel Hill, B.S., 1984
Leigh Carroll Haley, University of North Carolina at Chapel Hill, B.S., 1986
Russell David Hall, Guilford College, B.S., 1985
Zana Lynn Handy, University of North Carolina at Chapel Hill, B.A., 1982
Susan Jones Hardesty, Winthrop College, B.A., 1969
Christopher Ramon Harmon, University of North Carolina at Chapel Hill, B.A., 1985
Glenn Ray Harris, Pembroke State University, B.S., 1985

Amy Smith Henderson, University of North Carolina at Chapel Hill, B.A., 1986
Martin McMillan Henegar, University of North Carolina at Chapel Hill, B.S., 1985
Mark Taylor Hooten, Wake Forest University, B.A., 1986
Louise Foushee Horney, University of North Carolina at Chapel Hill, B.S., 1969
Rae Lynne Hornsby, University of North Carolina at Asheville, B.A., 1985
Leroy Karl Hubbert, North Carolina State University, B.S., 1985
Stacey Neal Ibrahim, University of North Carolina at Chapel Hill, B.A., 1985
Waleed Nabil Irani, University of North Carolina at Chapel Hill, B.A., 1985
Dominic Arthur Jaeger, Emory University, B.S., 1986
Linda Faye Johnson, University of North Carolina at Chapel Hill, B.A., 1986
Marion Cooper Johnson, University of North Carolina at Chapel Hill, B.S., 1986
Drew Alexander Jones, Duke University, B.A., 1986
Tony Jones, Pembroke State University, B.S., 1985
Sabine Kelischek, Davidson College, B.S., 1980
John Michael Kilby, Wake Forest University, B.A., 1986
Patricia Anne Koury, Wake Forest University, B.A., 1983
John Henry Krege, University of North Carolina at Chapel Hill, B.A., 1986
Knut Kverneland, Jr., University of North Carolina at Greensboro, B.A., 1985
Philip Carlyle Lackey, Davidson College, B.S., 1986
Allen Weeks Lalor, Duke University, B.S., 1986
Daniel Abraham Landes, University of Virginia, B.A., 1986
Harrison Armistead Latimer, Rice University, B.A., 1986
Edward Ingfei Lee, Duke University, B.S., 1984
Lori Brown Lilley, University of North Carolina at Chapel Hill, B.A., 1986
Andrew Kheng-Ann Lim, Carleton College, B.A., 1986
Ruth Anne Lininger, Duke University, B.S., 1985
Jay Robert Litchfield, University of Illinois at Urbana, B.S., 1985
Gary Blaine Loden, North Carolina State University, B.S., 1985
Lisa Re Marotto, Davidson College, B.S., 1986
Mark Edward Marotto, Eckerd College, B.S., 1981
Daniel Jack Meulenberg, Calvin College, B.A., 1986
Deborah Hazel Moore, University of Michigan at Ann Arbor, B.A., 1982
Clifford Vincent Morris, University of North Carolina at Chapel Hill, B.S., 1985
Sean Michael Muldowney, University of North Carolina at Chapel Hill, B.A., 1985
William Bernhard Naso, Davidson College, B.A., 1986
Wanda Kay Nicholson, University of North Carolina at Chapel Hill, B.A., 1986
Robert John Noecker, Massachusetts Institute of Technology, B.S., 1985

Lawrence Ross Nycum, Erskine College, B.A., 1984

Jill Suzanne Cole Obremskey, Duke University, B.S., 1986

Babatunde Adewale Olatidoye, North Carolina Agricultural and Technical State University, B.S., 1983

Steven Fleming Parker, University of North Carolina at Chapel Hill, B.A., 1982

Crystal Jade Pettiford, Spelman College, B.S., 1986

Marcus George Plescia, University of North Carolina at Chapel Hill, B.S., 1984

Steven James Poirier-McNeill, University of Notre Dame, B.S., 1986

Philip Wade Ponder, University of North Carolina at Chapel Hill, B.S., 1986

Karen Stacy Popovich, University of North Carolina at Chapel Hill, B.S., 1985

Margaret Rose Pressly, Erskine College, B.A., 1978

David Scott Price, Drew University, B.A., 1979

Jerry Lee Price, University of North Carolina at Chapel Hill, B.A., 1984

Maurice Gene Radford, Jr., University of North Carolina at Chapel Hill, B.A., 1986

Gregory Dean Randolph, University of North Carolina at Chapel Hill, B.S., 1984

Pamela Jean Reitnauer, Florida State University, B.S., 1977

Jennifer Lynn Ringstad, University of Oregon, B.A., 1982

Douglas Gordon Ririe, University of North Carolina at Chapel Hill, B.A., 1985

Henry Postlethwait Robson, III, University of North Carolina at Chapel Hill, B.S., 1986

John Gardiner Roddey, Jr., Davidson College, B.A., 1985

Ronald Gray Rogers, North Carolina State University, B.S., 1983

John Tracy Roper, Jr., University of North Carolina at Chapel Hill, B.A., 1985

Angela Jean Royster, University of North Carolina at Chapel Hill, B.A., 1986

Edwin Hughes Scott, University of North Carolina at Chapel Hill, B.A., 1986

Christopher Clare Sellers, Dartmouth College, B.A., 1980

Ami Jayant Shah, University of North Carolina at Chapel Hill, B.S., 1986

Eugenia Britt Smith, University of North Carolina at Chapel Hill, B.A., 1983

Jennifer Sue Smith, University of North Carolina at Chapel Hill, B.S., 1986

Albertina Denise Smith-Banks, University of North Carolina at Chapel Hill, B.A., 1985

Nancy Lynn Stoudt, Davidson College, B.S., 1983

Thomas Scott Stroup, Middlebury College, B.A., 1982

Gregory William Suits, University of North Carolina at Chapel Hill, B.S., 1986

Sissel Kay Topple, Gordon College, B.S., 1986

Murphy Furman Townsend, III, University of North Carolina at Chapel Hill, B.S., 1986

Anne Marie Traynor, North Carolina State University, B.S., 1984

Penelope Celeste Treece, University of North Carolina at Chapel Hill, B.A., 1986

Michael Weldy Turner, University of North Carolina at Chapel Hill, B.A., 1984

Mark Steven Vernon, Western Carolina University, B.S., 1981

Colleen Victory, Duke University, B.S., 1983

Lori Fay Wecker, University of Pennsylvania, B.A., 1986

Kelley Elizabeth White, North Carolina State University, B.S., 1986

Craig Wierum, Duke University, B.S., 1984

James Todd Williams, North Carolina State University, B.S., 1986

Adam Spach Wilson, State University of California at Hayward, B.S., 1985

Joy Lynne Wilson, Drury College, B.A., 1986

John Howard Wood, Wake Forest University, B.S., 1983

Tonja Michelle Wynn, University of North Carolina at Chapel Hill, B.A., 1985

Humayun Ismail Zeya, Wake Forest University, B.A., 1980

Mark Woodrow Zimmerman, University of North Carolina at Chapel Hill, B.A., 1986

CLASS OF 1989

Robin Aaron Altman, University of Pennsylvania, B.S., 1985

Lisa Kay Alverson, North Carolina State University, B.S., 1985

Eliot Anthony Atstupenas, University of North Carolina at Chapel Hill, B.A., 1985

Paul Ethan Austin, University of North Carolina at Chapel Hill, B.A., 1985

Lanier Hasty Ayscue, North Carolina State University, B.S., 1974

Kristin Dutrow Baker, University of North Carolina at Chapel Hill, B.S., 1985

Scott McKinley Baker, University of North Carolina at Chapel Hill, B.S., 1985

Virginia Johnston Barnhardt, Davidson College, B.S., 1984

Robert Wayne Beale, Pembroke State University, B.H., 1983

Karen Elizabeth Beliles, University of Wisconsin at Madison, B.S., 1980

Laura Harman Berglund, University of North Carolina at Chapel Hill, B.A., 1982

Robert Street Berry, North Carolina State University, B.S., 1981

Julia Lynn Blevins, Elon College, B.A., 1982

Laura Katherine Bliss, University of North Carolina at Chapel Hill, B.S., 1980

Jean Margaret Blom, Elon College, B.A., 1985

Vincent Anthony Bonanno, State University at Rutgers, B.A., 1985

Brooke Arledge Bostic, University of Vermont, B.S., 1983

William Monroe Boyd, V, Duke University, B.S., 1985

Christopher Bullock, North Carolina Wesleyan College, B.A., 1984

Deirdre Ann Burns, University of North Carolina at Chapel Hill, B.A., 1983

Shannon Stewart Carson, North Carolina State University, B.S., 1985

Donald Dickinson Carver, Lehigh University, B.A., 1985

Mary Frances Casey, University of North Carolina at Chapel Hill, B.A., 1985

Walter Inkyun Choung, University of North Carolina at Chapel Hill, B.A., 1985

Carol Ann Churchill, University of California at Riverside, B.S., 1978

Valarie Cheri Clayborn, Duke University, B.A., 1984

William Edward Cogburn, University of Florida, B.S., 1981

David Jay Collender, University of California at Riverside, B.A., 1978

Elizabeth Jo Conrad, Duke University, B.S., 1984

Peter Nicholas Copsis, Duke University, B.A., 1984

Donald Scott Covington, University of North Carolina at Chapel Hill, B.A., 1985

Brenda Kay Cowell, Duke University, B.S., 1984

William Clark Davenport, Duke University, B.S., 1978, University of North Carolina at Chapel Hill, M.S., 1984

Gwen Lynita David, Reed College, B.A., 1984

Robert Gregory Elgin, University of North Carolina at Chapel Hill, B.A., 1983

Robin Lesette Ellett, Williams College, B.A., 1977

Betsy Maurice English, Wofford College, B.S., 1985

Amy Hurst Evans, Duke University, B.S., 1983

Drew Craig Fillipo, Delaware Valley College of Science and Agriculture, B.S., 1981

Charles Joseph Forster, Belmont Abbey College, B.A., 1980

Frederick Alexander Frohbose, North Carolina Wesleyan College, B.A., 1978

Thomas Funcik, Northern Illinois University, B.S., 1979

Fletcher Lee Gamble, University of North Carolina at Chapel Hill, B.S., 1984

Brett Ratilal Gandhi, B.S., 1971

Patricia Hanna Gerr, Guilford College, B.S., 1984

Allen Lothrop Gifford, Harvard University, B.A., 1981

Carol Elaine Golin, Oberlin College, B.A., 1980

Daniel Thomas Goulson, Virginia Polytechnic Institute and State University, B.S., 1985

Kimberly Denise Grigsby, University of North Carolina at Chapel Hill, B.S., 1984

Michael Gruenthal, Clark University, B.A., 1976

Theresa Lyn Hamel, Michigan State University, B.S., 1986

Elizabeth Harris Hamilton, Wake Forest University, B.A., 1977

Douglas Brownell Hansen, Cornell University, B.A., 1979

William Randall Harris, IV, University of North Carolina at Chapel Hill, B.S., 1985

Robert Eric Hart, University of North Carolina at Chapel Hill, B.A., 1985

Ruth Landsberger Hazard, University of North Carolina at Chapel Hill, B.A., 1982

Mary Elizabeth Hebert, University of North Carolina at Chapel Hill, B.S., 1985

Jennifer Leigh Helton, University of North Carolina at Chapel Hill, B.A., 1985

Stephen Ward Hildebrand, University of North Carolina at Chapel Hill, B.A., 1985

Yung-chieh Ho, Johns Hopkins University, B.S., 1985

Cherri Deserea Hobgood, University of North Carolina at Greensboro, B.A., 1983

Jeffrey Dale Hoffman, University of North Carolina at Charlotte, B.S., 1980

George Thomas Holland, Methodist College, B.S., 1980
Lori Elizabeth Hood, University of North Carolina at Chapel Hill, B.A., 1984
David Emory Hoyle, University of North Carolina at Chapel Hill, B.A., 1976
Douglas Brett Huntley, University of North Carolina at Asheville, B.A., 1984
Donald Leland Ives, Westmont College, B.A., 1979
Robert Stephan Jablonover, Duke University, B.A., 1985
Rosemary Jackson, Mercer University, B.S., 1978
Thomas Lee Jeffries, Duke University, B.S., 1981
Patricia Lynn Jolie, College of Wooster, B.A., 1979
Daniel Max Kaplan, Harvard University, B.A., 1985
Michael Murray Keeley, Davidson College, B.S., 1985
William Huske Kelly, University of North Carolina at Chapel Hill, B.A., 1981
John Phillip J. Kim, University of North Carolina at Chapel Hill, B.A., 1984
Sarah Colman Klemmer, University of North Carolina at Chapel Hill, B.A., 1983
Lisa Ann Koehler, Duke University, B.S., 1985
Laleh Koochek, University of North Carolina at Asheville, B.S., 1984
Charles Gordon Lampley, IV, Davidson College, B.S., 1985
William Lander Lawing, University of North Carolina at Chapel Hill, B.A., 1980
Johnnie Agustus Lee, University of North Carolina at Chapel Hill, B.A., 1985
Lisa Carol Sykes Leland, University of North Carolina at Chapel Hill, B.A., 1985
Laurel Kristin Leslie, Harvard University, B.A., 1982
Thomas Gene Lightfoot, Duke University, B.S., 1984
Kermit Alvin Lloyd, University of North Carolina at Chapel Hill, B.A., 1985
Joel Douglas MacDonald, University of North Carolina at Chapel Hill, B.A., 1985
Margaret Ferriter Marsden, High Point College, B.A., 1977
Mary Alice Marshbanks, University of North Carolina at Chapel Hill, B.S., 1984
William Frederick McGuirt, Jr., Davidson College, B.S., 1985
Jacquelene Marie Mitchell McIntyre, Oakwood College, B.S., 1986
Christopher Dale McKinney, University of North Carolina at Chapel Hill, B.S., 1983
James Martin McLean, University of North Carolina at Chapel Hill, B.A., 1984
Melissa Mytyle McLeod, Mercer University, B.A., 1970
Jay Benjamin Michael, University of North Carolina at Greensboro, B.A., 1985
Harriet Merle Miller, Tufts University, B.A., 1981
Linda Kay Mitchell-Frye, University of North Carolina at Chapel Hill, B.S., 1985
Robert Elmer Most, University of North Carolina at Chapel Hill, B.A., 1984
Tona Leigh Munday, Emory University, B.A., 1985
Gregory Francis Murphy, Davidson College, B.S., 1985
Duong Xuan Nguyen, University of North Carolina at Chapel Hill, B.S., 1985

Robert Frederick Noel, Jr., Wake Forest University, B.A., 1985
Mary Louise Parker, North Carolina State University, B.S., 1985
Loel Zachary Payne, Duke University, B.S., 1985
Thomas Arthur Payne, High Point College, B.S., 1985
Richard Andrew Peters, University of North Carolina at Greensboro, B.S., 1982
Ruth Petersen, University of North Carolina at Chapel Hill, B.A., 1982
Jeffrey McBrayer Peterson, Wake Forest University, B.A., 1985
Dean Priest Porter, Duke University, B.A., 1985
Lisa Carolyn Richardson, University of North Carolina at Chapel Hill, B.S., 1985
Melva Jeannette Richardson, University of North Carolina at Chapel Hill, B.A., 1985
Kathy Sue Robinson, North Carolina State University, B.S., 1979
Gary Wayne Roper, University of North Carolina at Chapel Hill, B.A., 1985
Philip Wayne Royal, Guilford College, B.A., 1980
Rebecca Margaret Ryder, University of North Carolina at Chapel Hill, B.S., 1985
Angela P. Sanders-Cliette, George Washington University, B.A., 1981
Yolanda Valjene Scarlett, University of North Carolina at Chapel Hill, B.S., 1980
Kenneth Michael Scruggs, East Carolina University, B.S., 1985
Rick Paul Sessions, University of North Carolina at Chapel Hill, B.A., 1976
Gertrude Koch Shahady, University of North Carolina at Chapel Hill, B.A., 1984
Elizabeth Perkins Sharpless, Brown University, B.S., 1984
Mary Denise Shearin, University of North Carolina at Chapel Hill, B.A., 1985
Mary Elizabeth Sheehy, Princeton University, B.A., 1985
Arthur James Shepard, III, University of North Carolina at Chapel Hill, B.A., 1984
Gary Bradley Sherrill, University of North Carolina at Chapel Hill, B.A., 1985
James Daniel Singer, North Carolina State University, B.S., 1985
Beat Daniel Steiner, University of North Carolina at Chapel Hill, B.S., 1984
John Haddon Stephenson, Wake Forest University, B.A., 1985
Martha Molly Wood Stevens, State University at Rutgers, B.A., 1984
Arthur Chester Stowe, Jr., Duke University, B.S., 1980
Christopher Paul Tardif, Duke University, B.S., 1983
Roy Clarence Terry, University of Georgia, B.S., 1985
Roderick O'Hara Thompson, Massachusetts Institute of Technology, B.S., 1982
Todd Wilson Trask, Duke University, B.A., 1984
Rudolph Joseph Triana, Jr., Wake Forest University, B.A., 1984
John Patrick van Houten, University of North Carolina at Chapel Hill, B.A., 1985
Thomas Paul Walden, North Carolina State University, B.A., 1985
James John Walsh, University of North Carolina at Greensboro, B.A., 1984

Lorna Alvernaz Ann Westfall, University of North Carolina at Greensboro, B.A., 1983

Forrest Sutton Whitaker, Duke University, B.S., 1985

Frances Virginia White, Princeton University, B.A., 1975

Barton Gee Williams, Virginia Military Institute, B.S., 1985

David Robert Williams, Jr., University of North Carolina at Chapel Hill, B.A., 1985

James Scott Williford, East Carolina University, B.S., 1982

Jon Pointon Woods, Vanderbilt University, B.A., 1982

Lydia North Wright, University of North Carolina at Chapel Hill, B.S., 1981

Ann Josie Yadusky, North Carolina State University, B.A., 1985

Wendell Gray Yarbrough, University of North Carolina at Chapel Hill, B.A., 1985

CLASS OF 1988

Elizabeth Craver Adams, University of North Carolina at Chapel Hill, B.S., 1983

Amanda Ingham Adler, State University of California at Davis, B.A., 1982

Mary Elizabeth Aitken, University of North Carolina at Chapel Hill, B.A., 1983

Rodney Holt Allen, North Carolina State University, B.S., 1984

Zeda Glass Amaya, University of North Carolina at Chapel Hill, B.A., 1983

Roc Winston Bauman, University of North Carolina at Chapel Hill, B.A., 1976

Joseph Taylor Bell, II, University of North Carolina at Chapel Hill, B.S., 1984

Stephen Joseph Bickston, Duke University, B.S., 1984

Darren Foster Biehler, University of North Carolina at Chapel Hill, B.A., 1984

Cecelia Kay Bishop, University of North Carolina at Chapel Hill, B.S., 1984

Cameron Trent Blackman, University of North Carolina at Chapel Hill, B.S., 1984

Elizabeth Ivey Blair, Meredith College, B.S., 1977

Michelle Louise Bleynat, University of North Carolina at Chapel Hill, B.S., 1985

Watson Allen Bowes, III, Colorado College, B.A., 1979

Jon Philip Brisley, University of North Carolina at Chapel Hill, B.A., 1984

Brenton Thomas Burkholder, University of Kentucky, B.A., 1973

James Blair Butler, University of North Carolina at Chapel Hill, B.A., 1984

Shelley Marie Cabbell, Cornell University, B.S., 1984

Jeffrey Paul Campbell, North Carolina State University, B.S., 1984

Maura Lynne Campbell, University of Tennessee, B.A., 1978, Memphis State University, M.S., 1980

Stephanie Calloway Carmichael, University of North Carolina at Chapel Hill, B.S., 1984

James Craig Charles, University of North Carolina at Greensboro, B.A., 1984

Elaine Myers Coats, University of North Carolina at Chapel Hill, A.B., 1977, University of North Carolina at Chapel Hill, M.A.T., 1978

Susan Ray Cohen, University of Cincinnati, B.H., 1984

Jack Martin Cole, University of North Carolina at Chapel Hill, B.A., 1984

Debra Lynn Coles, University of North Carolina at Chapel Hill, B.A., 1984

Lisa Angeline Catherine Cooper, Emory University, B.A., 1984

Jonathan Baldridge Covey, Stanford University, B.A., 1979

Denise Elaine Crute, Duke University, B.S., 1983

Anne Regina Cunanan, Duke University, B.A., 1984

Peter Gilbert Dalldorf, Cornell University, B.A., 1983

Keith Alan Davis, University of North Carolina at Chapel Hill, B.A., 1984

Lori Lynne Davis, Duke University, B.A., 1984

Marjorie Faith Davis, University of North Carolina at Greensboro, B.A., 1982

Margie Beazley Eason, University of North Carolina at Chapel Hill, B.S., 1975

Paul Richard Eason, Wake Forest University, B.A., 1984

Maha Abdul-Hafez Elkordy, North Carolina State University, B.S., 1982

Jack Michael Friday, University of North Carolina at Chapel Hill, B.A., 1984

Mary Elizabeth Froelich, University of North Carolina at Chapel Hill, B.A., 1979

Catherine Gaelyn Garrett, University of North Carolina at Chapel Hill, B.A., 1984

Jeannie Lorraine Giacchino, University of Santa Clara, B.S., 1976

Cynthia Marie Gregg, University of North Carolina at Chapel Hill, B.A., 1984

Andrew Harry Gross, State University of California at Berkeley, B.A., 1983

Kirsten Marie Gross, North Carolina State University, B.S., 1977

David Christopher Habel, University of North Carolina at Chapel Hill, B.S., 1983

Frenesa Kaye Hall, Harvard University, B.A., 1983

James Richard Hallman, Duke, B.S., 1983

Emily Alyssa Halpern, Duke University, B.S., 1981

Everette Bernard Hambric, Pembroke State University, B.S., 1974, North Carolina Agricultural and Technical State University, M.S., 1979

John David Hendrix, Jr., Davidson College, B.S., 1984

Sylvia Sutton Hendrix, University of North Carolina at Chapel Hill, B.A., 1984

David William Herion, University of North Carolina at Chapel Hill, B.A., 1984

David Curtis Hillsgrove, University of North Carolina at Chapel Hill, B.A., 1983

Daniel Philipp Holschneider, Johns Hopkins University, B.S., 1984

Mark Hom, Johns Hopkins University, B.A., 1984

Hunter Ashley Hoover, University of North Carolina at Chapel Hill, B.A., 1984

Robert Mark Hoyle, North Carolina State University, B.S., 1984

David Lawrence Ingram, Duke University, B.H., 1982

Sally Sockwell Ingram, University of North Carolina at Chapel Hill, B.S., 1981

James Carney Irion, University of North Carolina at Chapel Hill, B.S., 1973, Duke, B.S., 1978, University of North Carolina at Chapel Hill, M.P.H., 1983

Allison Lewis Jacokes, Davidson College, B.S., 1981

Carlton David Johnson, University of North Carolina at Chapel Hill, B.A., 1984

Michael Donald Johnson, East Carolina University, B.S., 1982

Nathaniel Johnson III, Winston-Salem State University, B.S., 1983

James Gilliam Johnston, II, New College of the University of South Florida, B.A., 1981

Jerry Dale Joines, University of North Carolina at Chapel Hill, B.A., 1973

Jonathan Laird Jones, University of North Carolina at Chapel Hill, B.A., 1984

Asha Rosalind Kallianpur, University of North Carolina at Chapel Hill, B.A., 1983

Stevan Keram, State University of California at Berkeley, B.A., 1975

Emily Eun-me Kim, Harvard University, B.A., 1982

Candace Williamson King, Bryn Mawr College, B.A., 1983

Stephen Curtis King, Davidson College, B.S., 1984

Susan Lee Kirby, North Carolina State University, B.S., 1982

Hannah Rachel Krigman, Amherst College, B.A., 1983

Ritsu Kuno, University of North Carolina at Chapel Hill, B.S., 1984

Jane Marsh Laco, Duke University, B.S., 1982

Michael Edward Lee, University of North Carolina at Chapel Hill, B.S., 1983

Rayman Wei-min Lee, Clemson University, B.S., 1984

Sara Heath Collins Lee, University of North Carolina at Greensboro, B.A., 1970

Beverly Joyce Lessane, University of North Carolina at Chapel Hill, B.A., 1983

Stuart Jeffrey Levin, Duke University, B.A., 1983

Thomas Fowler Lindsay, Eckerd College, B.A., 1972

Toni Moody Long, Howard University, B.S., 1984

Pamela Denise Love, University of North Carolina at Chapel Hill, B.A., 1983

Harold Luther Martin, Jr., Davidson College, B.A., 1983

David Alan May, Dartmouth College, B.A., 1981

Bobby Kenneth McCullen, Jr., Davidson College, B.S., 1984

Joshua Dent McDavid, Saint John's College, B.A., 1982

Anne Mary McDonagh, Wellesley College, B.A., 1984

Thaddeus LeVerne McDonald, III, University of North Carolina at Chapel Hill, B.A., 1973, Duke, M.Div., 1977

Marsden Hamilton McGuire, Yale University, B.A., 1978

William Stephen McMahon, Jr., University of North Carolina at Chapel Hill, B.A., 1984

Ester Hill McPhail, Spelman College, B.S., 1982 University of North Carolina at Chapel Hill, B.S., 1983

Yvette Marie Miller, University of North Carolina at Charlotte, B.S., 1979

James Nelson Mock, University of North Carolina at Chapel Hill, B.S., 1982

Catherine Laura Munson, Sarah Lawrence College, B.A., 1982

Elizabeth Ann Murphy, University of Minnesota at Minneapolis-Saint Paul, B.A., 1980

Philip Joseph Nahser, Jr., University of North Carolina at Chapel Hill, B.S., 1984

Andrew Scott Neish, Wake Forest University, B.A., 1983

William Todd Overcash, North Carolina State University, B.S., 1983

Richard Cameron Padgett, East Carolina University, B.S., 1984

Charles Edward Parke, University of North Carolina at Chapel Hill, B.A., 1984

Mahrad Paymani, University of North Carolina at Greensboro, B.A., 1983

Julie Thomas Peek, Yale University, B.S., 1984

Richard Maurice Peek, Jr., Davidson College, B.S., 1984

Gary Lee Pellom, Duke University, B.S., 1976

John Ethwell Ramsey Perry, III, University of North Carolina at Chapel Hill, B.S., 1984

Scott Miller Petty, Duke University, B.S., 1984

Kathryn Elizabeth Phillips, University of Rochester, B.H., 1972

Melinda Hill Privette, University of North Carolina at Chapel Hill, B.S., 1980

Gail Elizabeth Quackenbush, University of North Carolina at Chapel Hill, B.A., 1983

Jacquelyn Lorraine Redd, North Carolina Agricultural and Technical State University, B.S., 1984

Herman Kyle Rhodes, University of North Carolina at Chapel Hill, B.S., 1984

Ronald David Richmond, Duke University, B.A., 1983

Glenn Hickam Richmond, Jr., Southern Methodist University, B.A., 1972

Christine Seel Ritchie, Davidson College, B.A., 1984

David Wintner Roberson, Princeton University, B.H., 1981

Jeffery Earl Roller, University of North Carolina at Chapel Hill, B.A., 1983

Theresa Anne Rupp, Smith College, B.A., 1971

Norma Frances Safransky, Duke University, B.S., 1976

George Hebert Sumner Sanders, University of North Carolina at Chapel Hill, B.A., 1984

Deepak Sawhney, Davidson College, B.S., 1984

Charles David Scheil, Duke University, B.A., 1982

Karen Gipson Seaton, Duke University, B.S., 1983

John Robert Silver, Davidson College, B.A., 1984

Mary Claire Skrzynski, Duke University, B.S., 1984

Rosemarie Sladek, Purdue University, B.S., 1984

Daniel Ray Smith, North Carolina State University, B.S., 1983

Douglas Graham Smith, University of North Carolina at Chapel Hill, B.A., 1984

Samuel Thomas Sockwell, University of North Carolina at Chapel Hill, B.A., 1979

Daniel Jay Stackhouse, University of North Carolina at Chapel Hill, B.A., 1984

Emmett Fitzgerald Steward, Duke University, B.S., 1984

Bryant Walter Stolp, Stanford University, B.S., 1974

Jeffrey Whitcomb Stolz, University of Virginia, B.A., 1983

Mark Cooper Sturdivant, University of North Carolina at Chapel Hill, B.A., 1984

Brian Montgomery Sumner, North Carolina State University, B.S., 1983

Kassell Eugene Sykes, Jr., University of North Carolina at Chapel Hill, B.S., 1984

John David Symanski, Bethany College, B.A., 1979

Roger Pope Tart, Wake Forest University, B.S., 1984

David Timothy Thomas, University of North Carolina at Chapel Hill, B.S., 1984

Philip Tolleson Thwing, Emory University, B.A., 1984

Sameh Kamal Toma, North Carolina State University, B.S., 1981

Gowrie Anandarajah Ventimiglia, Dartmouth University, A.B., 1984

Spyro Peter Vulgaropulos, Tufts University, B.S., 1979

Treva Beaufort Watkins, University of North Carolina at Chapel Hill, B.S., 1983

Stanley Rudolph Watson, University of North Carolina at Chapel Hill, B.S., 1984

Edward William Whitesides, Davidson College, B.A., 1983

Elliott Fennell Williams, Pfeiffer College, B.S., 1983

John Douglas Wilson, University of North Carolina at Chapel Hill, B.S., 1982

Mark Edward Wilson, Georgia Institute of Technology, B.S., 1984

Albert Carl Winfield, II, University of North Carolina at Chapel Hill, B.S., 1984

Jean Elizabeth Zula, North Carolina Central University, B.S., 1982

CLASS OF 1987

Mary Lisa Abernethy, University of North Carolina at Chapel Hill, B.S., 1981

Robert Wayne Allen, East Carolina University, B.S., 1978

David Bruce Baird, University of North Carolina at Chapel Hill, B.S., 1983

Steven Howard Baker, North Carolina State University B.S., 1975, B.A., 1982

Linda Marie Raines Belhorn, University of North Carolina at Chapel Hill, B.A., 1982

Thomas H. Belhorn, Ohio State University, B.S., 1979

John Mark Bennett, University of North Carolina at Chapel Hill, B.A., 1983

William Stephen Blau, State University of New York at Stony Brook, B.S., 1973, Cornell University Ph.D., 1978

Charles Arthur Bolick, Wake Forest University, B.A., 1982

Bruce Stephen Boliek, University of North Carolina at Chapel Hill, B.A., 1983

David Warner Boone, Davidson College, B.S., 1983

Mark Branch, III, Massachusetts Institute of Technology, B.S., 1983

Douglas Garrett Briggs, University of Tennessee at Knoxville, B.A., 1983

Charles Jacob Brown, Oberlin College, B.M., 1977, B.A., 1978, Yale University, M.M., 1981

Billy Lee Buff, Jr., Wake Forest University, B.A., 1983

Melissa Ward Burch, Swarthmore College, B.A., 1981

Scott Eugene Campbell, University of North Carolina at Chapel Hill, B.A., 1983

Michael Bryan Caveness, North Carolina State University B.S., 1982, B.A., 1983

Philippa Ann Charlton, Duke University, B.A., 1980

James Michael Chimiak, United States Naval Academy, B.S., 1979

Charles Jihun Chung, University of North Carolina at Chapel Hill, B.A., 1983

Figen Ciloglu, University of North Carolina at Chapel Hill, B.A., 1982

Carolyn Clark, University of North Carolina at Chapel Hill, B.A., 1983

Gregor George Cleveland, Louisiana Polytechnic Institute, B.S., 1970, Rice University, M.A., 1973, Ph.D., 1975

David Allen Coggins, North Carolina State University, B.S., 1983

James Belknap Collawn, University of North Carolina at Chapel Hill, B.A., 1982

Robert Bryan Conley, Dartmouth College, B.S., 1982

Carey Gordon Cottle, Jr., University of North Carolina at Chapel Hill, B.A., 1983

Steven Thomas Coulter, Brown University, B.S., 1983

James Earl Crowe, Jr., Davidson College, B.S., 1983

Leon Entea Dantzler, Jr., Duke University, B.S., 1983

Keith Edward Davis, University of North Carolina at Chapel Hill, B.A., 1983

Miriam Hughes de Lyon, Wake Forest University, B.A., 1983

Ruth Ann Dickinson, University of North Carolina at Asheville, B.A., 1982

Anthony Joseph DiNome, Jr., University of NorthCarolina at Chapel Hill, M.S., 1980

Adrian Cedric Douglass, University of North Carolina at Chapel Hill, B.A., 1983

Ira Gordon Early, Jr., Emory University B.S., 1981

James Eugene Edwards, East Carolina University B.S., 1973, Western Carolina University, M.S., 1978

William Gavin Elliott, University of North Carolina at Charlotte, B.S., 1980

Sara Frances Thornburg Evans, Florida State University, B.M., 1976, M.M., 1978

Victor Steven Farrari, Davidson College, B.S., 1983

Daniel Scott Fiddler, Wheaton College, B.S., 1983

Daniel Sommers Frank, University of California at Los Angeles, B.S., 1983

Lee Anne Furlong, Duke University, B.A., 1970, Boston University, M.Ed., 1972

Ruth Ellen Gettes, Tufts University, B.S., 1978

Elton Lewis Grant, Duke University, B.S., 1982

Louise Lochrane Grant, University of North Carolina at Chapel Hill, B.A., 1979

Michael Lee Green, Bucknell University, B.A., 1983

Jama Bland Greene, Davidson College, B.S., 1983

J. Lewis Gregory, University of North Carolina at Chapel Hill, B.A., 1982

Paul Hagan, Jr., Winston-Salem State University, B.S., 1982

James Small Hagood, University of North Carolina at Chapel Hill, B.A., 1983

Allen Willard Hamrick, Wake Forest University, B.A., 1983

Gerrie Michelle Hand, University of North Carolina at Chapel Hill, B.A., 1983

Elizabeth Anthony Harlan, University of Virginia, B.A., 1982

Beverly Matthews Harrington, University of North Carolina at Chapel Hill, B.S., 1982

William Stuart Hartley, University of North Carolina at Chapel Hill, B.A., 1983

John Franklin Hatchett, Jr., North Carolina Agricultural and Technical State University, B.S., 1983

Richard Hratchia Havundjian, University of California at Los Angeles, B.A., 1982

Mark John Sherman Heath, Harvard University, B.A., 1983

Darrell Ernest Hester, University of North Carolina at Chapel Hill, B.A., 1982

Holly Ann Hill, Princeton University, B.A., 1982

Albert Richard Hinn, Jr., North Carolina State University, B.A., 1983

James Philmon Hooten, Jr., Davidson College, B.S. 1983

Susan Kathleen Hovey, Duke University, B.S., 1982

May Yimei Huang, University of Virginia, B.A., 1983

Richard Page Hudson, III, University of North Carolina at Chapel Hill, B.A., 1981

Dudley Allen Hudspeth, Duke University, B.A., 1981

Susan Foster Isbey, Duke University, B.S., 1979

Dennis Neill Jacokes, University of North Carolina at Chapel Hill, B.A., 1980

Robert Lee Jobe, University of North Carolina at Chapel Hill, B.S., 1983

Alfreda Jones, Pembroke State University, B.S., 1982

Constance Carpenter Jones, Darmouth College, B.A., 1982

James Gregory Kaufmann, Davidson College, B.S., 1983

William Walter King, Davidson College, B.S., 1983

David Aryen Klein, University of Rhode Island, B.A., 1974, University of North Carolina at Chapel Hill, M.A., 1979

Dennis Demosthenes Kokenes, Duke University, B.S., 1983

Bret Alan Kort, Calvin College, B.S., 1983

Kimberly Kylstra, Dartmouth College, B.A., 1983

Thomas Earl Lawrence, University of North Carolina at Chapel Hill, B.S., 1983

William Joseph LeLand, University of North Carolina at Chapel Hill, B.S., 1983

Catherine Mary Kuhn Lineberger, University of North Carolina at Charlotte, B.S., 1980

James Joseph Lockwood, Davidson Community College, A.S., 1978, North Carolina Agricultural and Technical State University, B.S., 1982

Wylie Donald Lowery, Jr., University of North Carolina at Chapel Hill, B.A., 1983

Albert Hung-pei Luh, University of North Carolina at Chapel Hill, B.A., 1982

Julia Ogden Lunsford, Univesity of North Carolina at Chapel Hill, B.A., 1975

Gustav Charles Magrinat, Harvard University, B.A., 1969

Paul Joseph Mainella, Davidson College B.S., 1983

Thomas Fleming Mattox, University of North Carolina at Chapel Hill, B.A., 1983

Jayne Patrice Maynor, Pembroke State University, B.S., 1983

Melinda Louise McCord, Wellesley College, B.A., 1979

Julia Winn McCutcheon, University of North Carolina at Chapel Hill, B.A., 1973

Cary Crane McDonald, University of North Carolina at Chapel Hill, B.S., 1980

James Willard Melton, Jr., Wake Forest University, B.A., 1983

Teresa Ann Bowen Melvin, Southeastern Community College, A.S., 1980, University of North Carolina at Chapel Hill, B.A., 1982

James Mitchell Merritt, Saint Andrews Presbyterian College, B.A., B.S., 1983

Douglas Eugene Mesler, Duke University, B.A., 1982

Carlton David Miller, University of North Carolina at Chapel Hill, B.A., 1983

Timothy Joe Misenheimer, University of North Carolina at Greensboro, B.A., 1978

Rex Jason Moody, University of North Carolina at Chapel Hill, B.S., 1983

Melisa Dara Moore, University of North Carolina at Chapel Hill, B.A., 1983

Sherry Lynn Morris, University of Maryland, B.S., 1980

Peter Ray Muller, University of Vermont, B.A., 1982

Lisle Marie Nabell, Duke University, B.S. 1982

Douglas Alan Nelson, Stanford University, B.A., 1983

Williams Ward Nichols, Duke University, B.A., 1979

Andrea Zita Nowotny, University of Pennsylvania, B.S., 1982

Mark Wilson Ochs, University of Pennsylvania, B.S., 1979

Frances Owl-Smith, Western Carolina University, B.S., 1983

Rajiv Dhruvkumar Pandya, University of North Carolina at Chapel Hill, B.S., 1983

Thomas Erik Paulson, North Carolina State University, B.S., 1983

John Perl, II, University of North Carolina at Chapel Hill, B.A., 1981

John Michael Petitto, Eckerd College, B.S., 1979

Virginia Harrison Burns Petitto, University of North Carolina at Chapel Hill, B.A., 1979

Herbert Charles Pfaff, Virginia Polytechnic Institute, B.S., 1980

Nancy Welcome Phifer, Converse College, B.A., 1972

Sharon Lynn Quarfordt, Duke University, B.A., 1983

Dennis Walter Regan, University of California at Los Angeles, B.A., 1978

John David Regan, Wake Forest University, B.A., 1978, University of Louisville, M.S., 1980, Duke University, M.B.A., 1983

Joel Douglas Rice, Hampshire College, B.A., 1981

Mark Kenneth Robbins, Gettysburg College, B.A., 1983

Joseph Baxter Roberson, Jr., University of North Carolina at Chapel Hill, B.A., 1983

Bennie Dwayne Roberts, University of North Carolina at Chapel Hill, B.A., 1983

Joseph Earl Roberts, Jr., Davidson College, B.S., 1983

Mary Susan Roberts, Davidson College, B.A., 1982

David Benjamin Robinson, Oberlin College, B.A., 1983

Young Rochelle, Jr., North Carolina Agricultural and Technical State University, B.S., 1982

Heather Hall Rohrer, University of North Carolina at Charlotte, B.C.A., 1974

Charles Alan Ross, University of North Carolina at Chapel Hill, B.A., 1982

Deborah Olive Russell, Georgia State University, B.S., 1973

John Robinson Saltzman, Tufts University, B.S., 1983

Daniel Mark Sappenfield, Davidson College, B.S., 1983

Marc Scott Schwartzberg, Emory University, B.A., 1983

Henry Lawrence Shapiro, Haverford College, B.A., 1980

Ronald Bruce Shapiro, University of North Carolina at Chapel Hill, B.A., 1977

David Lamon Sheppard, University of North Carolina at Chapel Hill, B.S., 1981

David James Sheridan, University of North Carolina at Chapel Hill, B.S., 1981

Roger Scott Sherman, Antioch University, B.A., 1982

William Reginald Sigmon, Jr., Wake Forest University, B.A., 1983

Stephanie Elaine Spottswood, University of Michigan, B.A., 1972, University of North Carolina at Chapel Hill, M.S., 1978

Eve Garlington Spratt, Florida State University, B.A., 1979

Robyn Lee Stacy-Humphries, Wake Forest University, B.S., 1983

Brian Scott Strauss, University of North Carolina at Chapel Hill, B.A., 1983

William Roger Sutton, University of North Carolina at Chapel Hill, B.S., 1983

Victoria Joy Brand Teague, Central Wesleyan College, B.A., 1983

Ellis Allan Tinsley, Jr., Davidson College, B.S., 1983

Quang Thanh Tran, Fayetteville Technical Institute, A.S., 1979, Western Carolina University, B.S., 1980

Michael Robert Tranfaglia, Harvard University, B.A., 1982

Melissa Suzanne Conrad Tucker, University of Virginia, B.A., 1983

Obinnaya Chiegeiro Umesi, Shaw University, B.S., 1980

Robert Michael Walasin, Westchester Community College, A.A.S., 1976, Mercy College, B.A., 1977, University of Bridgeport, M.S., 1979

Alene Howard Waller, University of Virginia, B.S., 1977

David Clark Ward, Dartmouth College, B.A., 1965, Florida State University, Ph.D., 1971

Mary Kay Washington, Mississippi State University, B.S., 1976, University of North Carolina at Chapel Hill, Ph.D., 1982

Jonathan Jay Weiner, Duke University, B.S., 1977

Leah Kae Wyerts, University of North Carolina at Chapel Hill, B.A., 1975, Duke University, M.A.T., 1978

Ralph Steven Wiseman, East Tennessee State University, B.S., 1976, Medical College of Georgia, B.S., 1979

Lisa Kay Wroblewski, Duke University, B.A., 1981

Paul Albert Young, North Carolina State University, B.S., 1983

Appendix A

The University of North Carolina at Chapel Hill

MISSION STATEMENT

The University of North Carolina at Chapel Hill has been built by the people of the State and has existed for two centuries as the nation's first state university. Through its excellent undergraduate programs, it has provided higher education to ten generations of students, many of whom have become leaders of the State and the nation. Since the nineteenth century, it has offered distinguished graduate and professional programs.

The University is a research university. Fundamental to this designation is a faculty actively involved in research, scholarship, and creative work, whose teaching is transformed by discovery and whose service is informed by current knowledge.

The mission of the University is to serve all the people of the State, and indeed the nation, as a center for scholarship and creative endeavor. The University exists to expand the body of knowledge; to teach students at all levels in an environment of reseach, free inquiry, and personal responsibility; to improve the condition of human life through service and publication; and to enrich our culture.

To fulfill this mission, the University must:

acquire, discover, preserve, synthesize, and transmit knowledge;

provide high quality undergraduate instruction to students within a community engaged in original inquiry and creative expression, while committed to intellectual freedom, to personal integrity and justice, and to those values that foster enlightened leadership for the State and the nation;

provide graduate and professional programs of national distinction at the doctoral and other advanced levels to future generations of research scholars, educators, professionals, and informed citizens;

extend knowledge-based services and other resources of the University to the citizens of North Carolina and their institutions to enhance the quality of life for all people in the State; and address, as appropriate, regional, national, and international needs.

This mission imposes special responsibilities upon the faculty, students, staff, administration, trustees, and other governance structures and constituencies of the University in their service and decision-making on behalf of the University.

April 25, 1986, as adopted by the Board of Trustees, The University of North Carolina at Chapel Hill.

The University of North Carolina

Sixteen Constituent Institutions

C. D. SPANGLER, JR., B.S., M.B.A., D.H.L., LL.D., *President*

RAYMOND H. DAWSON, B.A., M.A., Ph.D., *Vice-President for Academic Affairs*

L. FELIX JOYNER, A.B., *Vice-President for Finance*

ROY CARROLL, B.A., M.A., Ph.D., *Vice-President for Planning*

NATHAN F. SIMMS, JR., B.S., M.S., Ph.D., *Vice-President for Student Services and Special Programs*

JASPER D. MEMORY, B.S., Ph.D., *Vice-President for Research and Public Service*

WYNDHAM G. ROBERTSON, A.B., *Vice-President for Communications*

JAY M. ROBINSON, B.S., M.A., Ed.D., *Vice-President for Public Affairs*

RICHARD H. ROBINSON, JR., A.B., LL.B., *Assistant to the President*

JOHN W. DUNLOP, B.A., *Director, The University of North Carolina Center for Public Television*

History of the University

The University of North Carolina is composed of all the public institutions of higher education in North Carolina that confer degrees at the baccalaureate level or higher. The University was authorized by the State Constitution in 1776, and it was chartered in 1789 by the General Assembly.

The University of North Carolina opened its doors to students at Chapel Hill in 1795. Thereafter, beginning in the latter part of the nineteenth century, the General Assembly of North Carolina has established and supported fifteen other public senior institutions in keeping with Article IX, Section 8 of the Constitution of North Carolina, which provides that the "General Assembly shall maintain a public system of higher education, comprising The University of North Carolina and such other institutions of higher education as the General Assembly may deem wise."

By 1969 The University of North Carolina included six constituent institutions, governed by a single Board of Trustees. This multicampus University had its beginnings in legislation enacted in 1931, that defined The University of North Carolina to include The University of North Carolina at Chapel Hill, the North Carolina State University at Raleigh, and The University of North Carolina at Greensboro. In the 1960s three additional campuses were added: The University of North Carolina at Charlotte, The University of North Carolina at Asheville, and The University of North Carolina at Wilmington.

Beginning in 1877, the General Assembly of North Carolina established or acquired ten additional separately governed state-supported senior institutions of higher education: Appalachian State University, East Carolina University, Elizabeth City State University, Fayetteville State University, North Carolina Agricultural and Technical State University, North Carolina Central University, North Carolina School of the Arts, Pembroke State University, Western Carolina University, and Winston-Salem State University. Then, in 1971, the General Assembly redefined The University of North Carolina, and under the terms of that legislation all sixteen public senior institutions became constituent institutions of The University of North Carolina.

The constitutionally authorized Board of Trustees of the sixteen-campus University of North Carolina was designated the Board of Governors and this body is by law The University of North Carolina. The Board of Governors consists of thirty-two members elected by the General Assembly, and it is charged with "the general determination, control, supervision, management, and governance of all affairs of the constituent institutions." Each constituent institution also has a board of trustees composed of thirteen members: eight elected by the Board of Governors, four appointed by the Governor, and the elected president of the student body *ex officio*. (The School of the Arts has two additional *ex officio* trustees.) The principal powers of these institutional boards are exercised under a delegation of authority from the Board of Governors.

The chief executive officer of the University is the President. Each constituent institution of the University has its own faculty and student body. The chief administrative officer of each institution is the chancellor, who is responsible to the President.

General University Regulations and Policies

RESIDENCE STATUS FOR TUITION PURPOSES[1]

The following sections summarize important aspects of the residency law. A complete explanation of the Statute and the procedures under the Statute is contained in *A Manual to Assist the Public Higher Education Institutions of North Carolina in the Matter of Student Residence Classification for Tuition Purposes.* This *Manual* and other information concerning the application of this law are available for inspection in the Admissions Offices of the University. Copies of the *Manual* are also on reserve at the Robert B. House Undergraduate Library and in the Reserve Reading Room of the Health Sciences Library. All students are responsible for knowledge of the contents of the Statute and the *Manual.*

Every applicant for admission is required to make a statement as to his or her length of residence in North Carolina. A person who qualifies as a resident for tuition purposes under North Carolina law pays a lower rate of tuition than a nonresident. To qualify for in-state tuition, a legal resident must have been domiciled in North Carolina for at least twelve months immediately prior to the beginning of the term for which classification as a resident for tuition purposes is sought. The student must also establish that his or her presence in the State during such twelve-month period was for purposes of maintaining a bona fide domicile rather than for purposes of maintaining a mere temporary residence incident to enrollment in an institution of higher education. "Domicile" means one's permanent home of indefinite duration, as distinguished from a temporary place of abode; it is synonymous with "legal residence" and is established by being physically present in a place with the concurrent intent to make that place a domicile. To determine an individual's intent, the University evaluates his or her objectively verifiable conduct as an indicator of his or her state of mind.

Procedural Information

General. A student admitted to initial enrollment in an institution (or permitted to re-enroll following an absence from the institutional program which involved a formal withdrawal from enrollment) is classified by the admitting institution either as a resident or as a nonresident for tuition purposes prior to actual matriculation. In the absence of a current and final determination of the student's residence prior to matriculation, the student is classified a nonresident for tuition purposes. The institution will thereafter reach a final determination of the student's residence status. Unless a person supplies enough information to allow the admissions officer to classify him or her as a resident for tuition purposes, the person will be classified a nonresident for tuition purposes. A residence classification once assigned (and confirmed pursuant to any appellate process invoked) may be changed thereafter (with a corresponding change in billing rates) only at intervals corresponding with the established primary divisions of the academic calendar.

---

[1] The information in this section comes from three sources: (i) North Carolina General Statutes, §116-143.1, (ii) *A Manual to Assist the Public Higher Education Institutions of North Carolina in the Matter of Student Residence Classification for Tuition Purposes,* Revised September 1985, (iii) Chancellor's Rules and Procedures for Residence Classification of Students for Tuition Purposes.

Transfer Students. When a student transfers from one North Carolina public institution of higher education to another, he or she is required to be treated as a new student by the institution to which he or she is transferring and must be assigned an initial residence classification for tuition purposes. The residence classification of a student by one institution is not binding on another institution. The North Carolina institutions of higher education will assist each other by supplying residency information and classification records concerning a student to another classifying institution upon request.

The transfer into or admission to a different component of the same institution (e.g., from an undergraduate to a graduate or professional program) is not construed as a transfer from one institution to another and thus does not by itself require a reclassification inquiry unless (1) the affected student requests a reclassification inquiry or (2) the transfer or enrollment occurs following the lapse of more than one quarter, semester, or term during which the individual was not enrolled as a student.

Responsibility of Students and Prospective Students. Any student or prospective student in doubt concerning his or her residence status bears the responsibility for securing a ruling by completing an application for resident status and filing it with the admissions officer. The student who, due to subsequent events, becomes eligible for a change in classification, whether from out-of-state to in-state or the reverse, has the responsibility of immediately informing the Office of Admissions of these circumstances in writing. Failure to give complete and correct information regarding residence constitutes grounds for disciplinary action.

Application Process. A person may obtain an application for resident status from his or her admissions office. Applicants for admission who claim eligibility for the in-state tuition rate customarily complete a two-page residency application as a part of the admissions application packet. Some applicants for admission will thereafter be required to complete a further, four-page, residency application. Enrolled students seeking a change from nonresident to resident status are required to complete a four-page residency application. *All* applications for resident status must be filed with the proper admissions office before the end of the term for which resident status for tuition purposes is sought. The last day of the final examination period is considered the last day of the term.

After filing a resident status application, a person may receive a letter from his or her admissions office requesting more information in connection with that application. When a student receives such a request before the end of the term for which classification is sought, he or she must respond to that request no later than three weeks after the end of the term. If the student receives the request for supplemental information after the end of the term in question, he or she must supply the requested information within three weeks after receipt of the request. Failure to supply the requested information within the specified time limit will result in a continuation of the student's nonresident classification unless good cause is shown for such failure.

The admissions office may require an applicant for admission to file a residency application, or respond to a request for more information, more quickly when residence status is a factor in the admissions decision.

The pamphlet "Information About Resident Status for Tuition Purposes" contains more details about the residency application process and is available at all admissions offices.

Fraudulent Applications. If a student is classified a resident for tuition purposes after submitting falsified residentiary information or after knowingly withholding residentiary information, the student's application for in-state tuition status is fraudulent. The institution may re-examine any application suspected of being fraudulent and, if warranted, will change the student's residence status retroactively to the beginning of the term with respect to which the student originally made the fraudulent application. If this occurs the student must pay the out-of-state tuition differential for all the enrolled terms intervening between the fraudulent application and its discovery. Further, knowing falsification of responses on a resident status application may subject the applicant to disciplinary consequences, including dismissal from the institution.

Burden of Proof and Statutory Prima Facie Evidence. A person has the burden of establishing facts which justify his or her classification as a resident for tuition purposes. The balancing of all the evidence must produce a preponderance of evidence supporting the assertion of in-state residence. Under the Statute, proof of resident status is controlled initially by one of two evidentiary beginning points which are stated in terms of prima facie evidence.

a. Even if the person is an adult, if his or her parents (or court-appointed guardian in the case of some minors) are not legal residents of North Carolina, this is prima facie evidence that the person is not a legal resident of North Carolina unless he or she has lived in this state the five consecutive years prior to enrolling or re-registering. To overcome this prima facie showing of nonresidence, a person must produce evidence that he or she is a North Carolina domiciliary despite the parents' nonresident status.

b. Conversely, if the person's parents are domiciliaries of North Carolina under the Statute, this fact constitutes prima facie evidence that the person is a domiciliary of North Carolina. This prima facie showing may also be overcome by other evidence to the contrary. If a person has neither living parents nor legal guardian, the prescribed prima facie evidence rule cannot and does not apply.

Erroneous Notices Concerning Classification. If a student, who has been found to be a nonresident for tuition purposes, receives an erroneous written notice from an institutional officer identifying the student as a resident for tuition purposes, the student is not responsible for paying the out-of-state tuition differential for any enrolled term beginning before the classifying institution notifies the student that the prior notice was erroneous.

Grace Period. If a student has been properly classified as a North Carolina resident for tuition purposes and, thereafter, his or her state of legal residence changes while he or she is enrolled in a North Carolina public institution of higher education, the statute provides for a grace period during which the student is allowed to pay tuition at the in-state rate despite the fact that the student is no longer a North Carolina legal resident. This grace period extends for a minimum of twelve months from the date of change in legal residence, and if the twelve-month period ends during a semester or academic term in which the student is enrolled, the grace period extends also to the end of that semester or academic term.

Reacquisition of Resident Tuition Status. The prescribed twelve-month period of legal residence may be shortened if the person seeking to be classified as a resident for tuition purposes was formerly classified a North Carolina resident for tuition purposes, abandoned North Carolina domicile, and reestablished North Carolina domicile within twelve months after abandoning it. Interested persons should consult their admissions offices for a detailed explanation of the conditions which must be met to qualify under this section.

Appeals. A student appeal of a classification decision made by any admissions officer must be in writing and signed by the student and must be filed by the student with that officer within fifteen working days after the student receives notice of the classification decision. The appeal is transmitted to the Residence Status Committee by that officer, who does not vote in that Committee on the disposition of such appeal. The student is notified of the date set for consideration of the appeal, and, on request of the student, he or she is afforded the opportunity to appear and be heard by the Committee. Any student desiring to appeal a decision of the Residence Status Committee must give notice in writing of that fact (within ten days of receipt of the Committee's decision) to the Chairman of the Residence Status Committee, and the Chairman promptly processes the appeal for transmittal to the State Residence Committee.

It is the responsibility of the student to pay tuition at the rate charged and billed while an appeal is pending. In effect, the student who is classified a nonresident at the time of tuition billing pays the nonresident rate. Conversely, if a student is classified as a resident at the time of billing, he or she pays the resident rate. Any necessary adjustments in the rate paid will be made at the conclusion of the appeal.

Application of the Law to Specific Situations

Aliens. Aliens who are permanent residents of the U.S., or who hold a visa which will permit eventual permanent residence in the U.S., are subject to the same considerations with respect to determination of legal residence as citizens. An alien abiding in the U.S. under a visa conditioned at least in part upon intent not to abandon a foreign domicile (B, F, H, and J visas) cannot be classified a resident. An alien abiding in the U.S. under a visa issued for a purpose which is so restricted as to be fundamentally incompatible with an assertion by the alien of bona fide intent to establish a legal residence (C, D, and M visas) cannot be classified a resident.

Possession of certain other immigration documents may also allow an alien to be considered for in-state tuition status. For more details aliens should consult their admissions offices and the *Manual.* Aliens must file a Residence Status Supplemental Form in addition to the forms normally required of applicants for resident status for tuition purposes.

Married Persons. The domicile of a married person, irrespective of sex, is determined by reference to all relevant evidence of domiciliary intent. No person is precluded, solely by reason of marriage to a person domiciled outside of North Carolina, from establishing or maintaining legal residence in North Carolina. No person is deemed, solely by reason of marriage to a person domiciled in North Carolina, to have established or maintained a legal residence in North Carolina. The fact of marriage and the place of the domicile of his or her spouse are deemed relevant evidence to be considered in ascertaining domiciliary intent.

If a person otherwise can demonstrate compliance with the fundamental statutory requirement that he or she be a legal resident of North Carolina before the beginning of the term for which resident status is sought, the second statutory requirement relating to duration of residence may be satisfied derivatively, in less than twelve months, by reference to the length of the legal residence of the person's spouse, if the spouse has been a legal resident of the State for the requisite twelve-month period.

Military Personnel. The domicile of a person employed by the Federal government is not necessarily affected by assignment in or reassignment out of North Carolina. Such a person may establish domicile by the usual requirements of residential act plus intent. No person loses his or her in-state resident status solely by serving in the armed forces outside of the State of North Carolina.

Minors. A minor is any person who has not reached the age of eighteen years. Under the common law, a minor child whose parents are not divorced or legally separated is presumed to have the domicile of his or her father. This presumption may be rebutted if a preponderance of the evidence indicates that the mother and father have separate domiciles *and* that, under the circumstances, the child can fairly be said to derive his or her domicile from the mother. If the father is deceased, the domicile of the minor is that of the surviving mother. If the parents are divorced or legally separated, the domicile of the minor is that of the parent having custody by virtue of a court order; or, if no custody has been granted by virtue of court order, the domicile of the minor is that of the parent with whom he or she lives; or, if the minor lives with neither parent, in the absence of a custody award, the domicile of the minor is presumed to remain that of the father. If the minor lives for part of the year with each parent, in the absence of a custody award, the minor's domicile is presumed to remain that of the father. These common law presumptions control even if the minor has lived in North Carolina for five years as set forth above in **Burden of Proof and Statutory Prima Facie Evidence**, subsection a.

In determining residence status for tuition purposes, there are three exceptions to the above provisions:

1. If a minor's parents are divorced, separated, or otherwise living apart and one parent is a legal resident of North Carolina, during the time period when that parent is entitled to claim, and does claim, the minor as a dependent on the North Carolina individual income tax return, the minor is deemed to be a legal resident of North Carolina for tuition purposes, notwithstanding any judicially determined custody award with respect to the minor.

If, immediately prior to his or her eighteenth birthday, a person would have been deemed to be a North Carolina legal resident under this provision but he or she achieves majority before enrolling in a North Carolina institution of higher education, that person will not lose the benefit of this provision if the following conditions are met:

a. Upon achieving majority the person must act, as much as possible, in a manner consistent with bona fide legal residence in North Carolina; and

b. The person must begin enrollment at a North Carolina institution of higher education not later than the fall academic term next following completion of education prerequisite to admission at the institution.

2. If, immediately prior to beginning an enrolled term, the minor has lived in North Carolina for five or more consecutive years in the home of an adult relative (other than a parent) who is a legal resident of North Carolina, and if the adult relative, during those years, has functioned as a de facto guardian of the minor, then the minor is considered a legal resident of North Carolina for tuition purposes. If a minor qualified for resident status for tuition purposes under this provision immediately prior to his or her eighteenth birthday, then, upon becoming eighteen, he or she will be deemed to be a legal resident of North Carolina of at least twelve months' duration.

3. Even though a person is a minor, under certain circumstances the person may be treated by the law as being sufficiently independent from his or her parents as to enjoy a species of adulthood for legal purposes. If the minor marries or obtains a judicial decree of emancipation under N.C. Gen. Stat. §7A-717, *et seq.*, he or she is emancipated. The consequence, for present purposes, of such emancipation is that the affected person is presumed to be capable of establishing a domicile independent of that of the parents; it remains for that person to demonstrate that a separate domicile has, in fact, been established.

Prisoners. There are special provisions concerning domicile of prisoners. For more information, persons to whom these provisions may apply should consult the *Manual.*

Property and Taxes. Ownership of property in or payment of taxes to the State of North Carolina apart from legal residence will not qualify one for the in-state tuition rate.

Students or prospective students who believe that they are entitled to be classified residents for tuition purposes should be aware that the processing of requests and appeals can take a considerable amount of time and that applications for classification should not be delayed until registration, when the number of applications makes accelerated handling impossible.

MILITARY TUITION BENEFIT[1]

Certain members of the Armed Services, and their dependent relatives, who are not residents for tuition purposes may become eligible to be charged less than the out-of-state tuition rate under N.C. Gen. Stat. §116-143.3, the military tuition benefit provision. Any person seeking the military tuition benefit must qualify for admission to UNC-CH and must file an application for the benefit with his or her admissions office before the first day of classes of the term for which he or she initially seeks the benefit. To remain eligible to receive the military tuition benefit, he or she must file another application for the benefit before the first day of classes of the first term in which he or she is enrolled in each academic year. The burden of proving eligibility for the military tuition benefit lies with the applicant for the benefit, and the application and all required supporting affidavits must be complete and in proper order before the first day of classes of the term in question. Because of the time involved in securing the necessary affidavits from the appropriate military authorities, prospective applicants for the military tuition benefit are urged to secure application forms from their admissions offices and begin the application process several weeks before the first day of classes of the term for which they seek the benefit.

Eligibility of Members of the Armed Services. Eligible members of the Armed Services pay a rate of tuition computed by applying a statutory formula which is dependent, in part, on the amount of money payable by their Service employer to them or to the institution by reason of their enrollment. Application of the statutory formula yields the following results: if the service member's education is being fully funded by the Service employer, the amount of tuition owed is equal to out-of-state tuition; if the member's education is not being funded by his or her Service employer, he or she pays an amount equal to in-state tuition; and if the Service employer is providing partial educational funding, the amount of tuition owed depends on the amount of funding contributed by the Service employer.

To be eligible for this military tuition benefit, the individual must

a. be a member of the United States Air Force, Army, Coast Guard, Marine Corps, Navy, North Carolina National Guard, or a reserve component of one of these services; and

b. be abiding in North Carolina incident to active military duty which is performed at or from a duty station in North Carolina.

Eligibility of Dependent Relatives of Service Members. If the service member meets the conditions set forth above, his or her dependent relatives may be eligible to pay the in-state tuition rate if they share the service member's North Carolina abode; if they have complied with the requirements of the Selective Service System, if applicable; and if they qualify as *military* dependents of the service member.

If the service member voluntarily ceases to live in North Carolina or is involuntarily absent from the state on military orders (other than absences on routine maneuvers and temporary assignments), he or she is deemed to have moved his or her abode from North Carolina. If a dependent relative of a service member has become eligible for the military tuition benefit and, after the beginning of the term of eligibility, the service member moves his or her abode from North Carolina, the dependent relative will continue to be eligible for the military tuition benefit only for the remainder of that academic year. An academic year runs from the first day of classes of the fall semester through the last day of exams of the following summer session, second term.

For a detailed explanation of the military tuition benefit provision (including an explanation of the formula used to compute the tuition rate for service members), a complete list of categories of persons who are considered "dependent relatives" for purposes of establishing eligibility for the military tuition benefit, and information about the registration requirements of the Selective Service System, applicants should consult *A Manual to Assist the Public Higher Education Institutions of North Carolina in the Matter of Student Residence Classification for Tuition Purposes* (as amended September 1985). This *Manual* is available for inspection in the Admissions Offices of the University. Copies of the *Manual* are also on reserve at the Robert B. House Undergraduate Library, and in the Reserve Reading Room of the Health Sciences Library.

---

[1] The information in this section comes from three sources: (i) North Carolina General Statutes, §116-143.3, (ii) *A Manual to Assist the Public Higher Education Institutions of North Carolina in the Matter of Student Residence Classification for Tuition Purposes,* Revised September 1985, (iii) Chancellor's Rules and Procedures for Residence Classification of Students for Tuition Purposes and Determination of Eligibility for the Special Military Tuition Benefit.

Appeals of Eligibility Determinations of Admissions Officers. A student appeal of an eligibility determination made by any admissions officer must be in writing and signed by the student and must be filed by the student with that officer within fifteen working days after the student receives notice of the eligibility determination. The appeal is transmitted to the Residence Status Committee by that officer, who does not vote in that Committee on the disposition of such appeal. The student is notified of the date set for consideration of the appeal, and, on request of the student, he or she is afforded an opportunity to appear and be heard by the Committee.

Any student desiring to appeal a determination of the Residence Status Committee must give notice in writing of that fact to the Chairman of the Residence Status Committee within ten days of receipt of the Committee's decision. The Chairman will promptly process the appeal for transmittal to the State Residence Committee.

THE FAMILY EDUCATIONAL RIGHTS AND PRIVACY ACT

As a general rule, under the federal Family Educational Rights and Privacy Act (FERPA), personally identifiable information may not be released from a student's education records without his or her prior written consent. Exceptions to this rule are set out in the FERPA regulations and the FERPA policy of The University of North Carolina at Chapel Hill.

UNC-CH will disclose personally identifiable information from the education records of a student, without the student's prior written consent, to officials of another school or school system in which the student seeks or intends to enroll. UNC-CH will also disclose personally identifiable information from an enrolled student's education records, without the student's prior written consent, to officials of another school or school system in which the student is contemporaneously enrolled.

UNC-CH also makes public certain information that has been designated as "directory information": the student's name, address, telephone listing, date and place of birth, major field of study, class, enrollment status (full-time, half-time, or part-time), participation in officially recognized activities and sports, weight and height of members of athletic teams, dates of attendance, degrees and awards received, and the most recent previous educational agency or institution attended by the student. Examples of ways in which some of this information is made public include: names of students who receive honors and awards, who make the Dean's List, who hold offices, or who are members of athletic teams. The annual commencement program publishes the names of degree recipients. The University also publishes the *Campus Directory* annually, and some professional and graduate student groups publish directories of students in their departments or schools.

Students who do not wish to have any or all "directory information" made public without their prior consent, must send the Office of the University Registrar (CB# 2100, 105 Hanes Hall, The University of North Carolina at Chapel Hill) a signed and dated notice specifying items that are not to be published. To ensure that a listing for the student will not appear in the *Campus Directory*, this notice must be received by the Office of the University Registrar by the end of the registration period for the semester or session of first enrollment or, after an absence, of reenrollment. Such a notice will be honored until the student graduates, ceases to attend, or withdraws from the University unless the student notifies the Office of the University Registrar to the contrary in writing.

Students also have the right to inspect their "education records" as defined in the FERPA regulations. They may not inspect financial records and statements of their parents; confidential letters of recommendation placed in their education records before January 1, 1975 (with some exceptions); or confidential letters of recommendation placed in their education records after January 1, 1975, if they have waived their rights to inspect and review such letters.

A student who believes that information in his or her education records is inaccurate or misleading or violates his or her privacy or other rights may request that the institution amend the records, and, if the request is denied, he or she has the right to a hearing. If, after the hearing, the institution decides that the information is not inaccurate, misleading, or violative of privacy or other rights, the student has a right to place a statement in those records commenting on the information in question or giving the student's reasons for disagreeing with the institutional decision. The student may also place such a statement in his or her records in lieu of requesting a hearing. Complaints alleging violations of FERPA rights may also be filed with the U.S. Department of Education.

Questions about FERPA should be addressed to the Legal Adviser to the Special Assistant to the Chancellor (CB# 9150, 01 South Building). The text of FERPA and its regulations and the University's FERPA policy are also available for inspection in 01 South Building.

FIREARMS AND OTHER WEAPONS

The possession of any gun, rifle, pistol, dynamite cartridge, bomb, grenade, mine, explosive, bowie knife, dirk, dagger, slingshot, leaded cane, switchblade knife, blackjack, metallic knuckles, or any other weapons of like kind upon any University campus or in any University owned or operated facility is unlawful and contrary to University policy. Violation of this prohibition is a misdemeanor punishable by a fine not to exceed $500 and/or six months' imprisonment, and may constitute a violation of the Campus Code.

IMMUNIZATION REQUIREMENT

Effective July 1, 1986, North Carolina State law requires that no person shall attend a college or university in North Carolina unless a certificate of immunization indicating that the person has received the immunizations required by the law is presented to the college or university on or before the first day of matriculation. Students enrolled at UNC-CH on July 1, 1986 are exempt from this requirement.

If the UNC-CH Medical History Form containing the certificate of immunization is not in the possession of the UNC-CH Student Health Service ten (10) days prior to the registration date, the University shall present a notice of deficiency to the person. The person shall have 30 calendar days from the first day of attendance to obtain the required immunizations. Those persons who have not complied with the immunization requirements by the end of 30 calendar days will be *administratively withdrawn* from the University.

The University of North Carolina at Chapel Hill

POLICY ON ILLEGAL DRUGS

I. INTRODUCTION

The Board of Trustees of The University of North Carolina at Chapel Hill, in conformity with the direction of the Board of Governors of The University of North Carolina, hereby adopts this Policy on Illegal Drugs, effective August 24, 1988. It is applicable to all students, faculty members, administrators, and other employees.

II. EDUCATION, COUNSELING, AND REHABILITATION

A. The University of North Carolina at Chapel Hill has established and maintains a program of education designed to help all members of the university community avoid involvement with illegal drugs. This educational program emphasizes these subjects:

1. The incompatibility of the use or sale of illegal drugs with the goals of the university;
2. The legal consequences of involvement with illegal drugs;
3. The medical implications of the use of illegal drugs; and
4. The ways in which illegal drugs jeopardize an individual's present accomplishments and future opportunities.

B. The University of North Carolina at Chapel Hill provides information about drug counseling and rehabilitation services available to members of the university community through campus-based programs and through community-based organizations. Persons who voluntarily avail themselves of university services are hereby assured that applicable professional standards of confidentiality will be observed.

III. ENFORCEMENT AND PENALTIES

A. The University of North Carolina at Chapel Hill shall take all actions necessary, consistent with State and Federal law and applicable university policy, to eliminate illegal drugs from the university community. The University's Policy on Illegal Drugs is publicized in catalogs and other materials prepared for all enrolled and prospective students and in materials distributed to faculty members, administrators, and other employees.

B. Students, faculty members, administrators, and other employees are responsible, as citizens, for knowing about and complying with the provisions of North Carolina law that make it a crime to possess, sell, deliver, or manufacture those drugs designated collectively as "controlled substances" in Article 5 of Chapter 90 of the North Carolina General Statutes. Any member of the university community who violates that law is subject both to prosecution and punishment by the civil authorities and to disciplinary proceedings by the university. It is not "double jeopardy" for both the civil authorities and the university to proceed against and punish a person for the same specified conduct. *The university will initiate its own disciplinary proceeding against a student, faculty member, administrator, or other employee when the alleged conduct is deemed to affect the interests of the university.*

C. Penalties will be imposed by the university in accordance with procedural safeguards applicable to disciplinary actions against students, faculty members, administrators, and other employees, as required by Section 3 of the Trustee Policies and Regulations Governing Academic Tenure in The University of North Carolina at Chapel Hill, by Section III.D of the Employment Policies for EPA Nonfaculty Employees of The University of North Carolina at Chapel

Hill, by regulations of the State Personnel Commission, and the Disciplinary Procedure of the Staff Personnel Administration Guides (SPAG 37), by the Instrument of Student Judicial Governance, and by all other applicable provisions of the policies and procedures of The University of North Carolina at Chapel Hill.

D. The penalties to be imposed by the university may range from written warnings with probationary status to expulsions from enrollment and discharges from employment. However, the following minimum penalties shall be imposed for the particular offenses described.

1. *Trafficking in Illegal Drugs*
    a. For the illegal manufacture, sale or delivery, or possession with intent to manufacture, sell or deliver, of any controlled substance identified in Schedule I, N.C. General Statutes 90-89, or Schedule II, N.C. General Statutes 90-90 (including, but not limited to, heroin, mescaline, lysergic acid diethylamide, opium, cocaine, amphetamine, methaqualine), any student shall be expelled and any faculty member, administrator, or other employee shall be discharged.
    b. For a first offense involving the illegal manufacture, sale or delivery, or possession with intent to manufacture, sell or deliver, of any controlled substance identified in Schedules III through VI, N.C. General Statutes 90-91 through 90-94, (including, but not limited to, marijuana, anabolic steroids, pentobarbital, codeine), the minimum penalty shall be suspension from enrollment or from employment for a period of at least one semester or its equivalent.[1] For a second offense, any student shall be expelled and any faculty member, administrator, or other employee shall be discharged.
2. *Illegal Possession of Drugs*
    a. For a first offense involving the illegal possession of any controlled substance identified in Schedule I, N.C. General Statutes 90-89, or Schedule II, N.C. General Statutes 90-90, the minimum penalty shall be suspension from enrollment or from employment for a period of at least one semester or its equivalent.[2]
    b. For a first offense involving the illegal possession of any controlled substance identified in Schedules III through VI, N.C. General Statutes 90-91 through 90-94, the minimum penalty shall be probation, for a period to be determined on a case-by-case basis. A person on probation must agree to participate in a drug education and counseling program, consent to regular drug testing, and accept such other conditions and restrictions, including a program of community service, as the Chancellor or the Chancellor's designee deems appropriate. Refusal or failure to

---

[1] Employees subject to the State Personnel Act are governed by regulations of the State Personnel Commission. Because the minimum penalty specified in this Section and required by the Board of Governors exceeds the maximum period of suspension without pay that is permitted by State Personnel Commission regulations, the penalty for a first offense for employees subject to the State Personnel Act is discharge.

[2] Employees subject to the State Personnel Act are governed by regulations of the State Personnel Commission. Because the minimum penalty specified in this Section and required by the Board of Governors exceeds the maximum period of suspension without pay that is permitted by State Personnel Commission regulations, the penalty for a first offense for employees subject to the State Personnel Act is discharge.

abide by the terms of probation shall result in suspension from enrollment or from employment for any unexpired balance of the prescribed period of probation.[3]

c. For a second or other subsequent offenses involving the illegal possession of controlled substances, progressively more severe penalties shall be imposed, including expulsion of students and discharge of faculty members, administrators, or other employees.

E. Suspension Pending Final Disposition

When a student, faculty member, administrator, or other employee has been charged by the university with a violation of policies concerning illegal drugs, he or she may be suspended from enrollment or employment before initiation or completion of regular disciplinary proceedings if, assuming the truth of the charges, the Chancellor, or in the Chancellor's absence, the Chancellor's designee concludes that the person's continued presence within the university community would constitute a clear and immediate danger to the health or welfare of other members of the university community; provided, that if such a suspension is imposed, an appropriate hearing of the charges against the suspended person shall be held as promptly as possible thereafter.

IV. IMPLEMENTATION AND REPORTING

Annually, the Chancellor shall submit to the Board of Trustees a report on campus activities related to illegal drugs for the preceding year. The reports shall include, as a minimum, the following:

(1) a listing of the major education activities conducted during the year;

(2) a report on any illegal drug-related incidents, including any sanctions imposed;

(3) an assessment by the Chancellor of the effectiveness of the campus program and;

(4) any proposed changes in the Policy on Illegal Drugs.

A copy of the report shall be provided to the President, who shall confer with the Chancellor about the effectiveness of campus programs.

---

[3] If this balance for an employee subject to the State Personnel Act exceeds three days, that employee shall be discharged.

Appendix B
Educational Policies of the School of Medicine

The educational policies and procedures of the School of Medicine are printed here to provide an idea of the philosophy and practices of the educational curriculum. The School reserves the right to change policies and procedures recommended here as the curriculum continues to develop and change, or as merited by the circumstances in an individual case.

LIST OF POLICIES

1. Student Evaluation—The Preclinical Years
2. Student Evaluation—The Clinical Years
3. Credit by Examination—The Preclinical Years
4. Deceleration at Matriculation
5. Excuse from Examinations—The Preclinical Years
6. Student Health Policy Relative to Medical Excuses
7. Student Promotions Committee Process
8. Appeal of a Student Promotions Committee Decision
9. Appeal of a Course Grade
10. Dismissal for Non-Academic Reasons
11. Academic Assistance—The Preclinical Years
12. Academic Assistance—The Clinical Years
13. Code of Student Conduct
14. Impairment of Medical Students Due to Substance Abuse
15. Graduate Student Participation in Medical School Courses
16. Delay of Graduation
17. Leave of Absence

1. STUDENT EVALUATION—THE PRECLINICAL YEARS

I. Student Evaluation

The following policy attempts to minimize problems of "over-examining" which may result in competition for the students' attention amongst concurrently running courses, while still providing a mechanism to permit more than one evaluation per course. In addition, the policy incorporates the recommendation of the Curriculum Review, that stipulated that each student must pass every course.

A. Course directors will provide an evaluation for each student at the midpoint and at the end of their courses. Each course director may use "self-assessments" at his/her discretion. In the Mechanisms of Disease Course in the second year, an end-of-segment examination is recommended. This should, as far as possible, be an integrated examination designed by the faculty from the segments of the Mechanisms of Disease and Pathology courses.

B. Students found to have an unsatisfactory level of performance by a course director(s), in conjunction with course faculty, at the midpoint evaluation, will be seen by their class advisors, and if appropriate, the Assistant Dean for Academic Affairs. This process encourages prompt recognition of students in need of ongoing assistance, and when advisable, timely initiation of assistance. The form of the midcourse evaluation should be comparable to the end-of-course evaluation. In an effort to maintain the integrity of the teaching day and to discourage students from cutting class to study for an examination, midterm and final examination periods have been scheduled in each semester. Almost all major examinations are scheduled within these periods; exams (such as Segment exams) that fall between exam periods will be given on Monday mornings at 8:00 a.m.

C. Course directors will be responsible for the type of evaluation used in their courses. They should be reminded of the sentiment expressed by the faculty for the desirability of decreasing the reliance on National Board Examinations.

D. The faculty should be encouraged to explore examination formats, such as completing a statement or writing a brief essay, rather than using the traditional National Board of Medical Examiners Examination (NBME-formatted) questions. It is felt that a shift away from the National Board style of examination will bring about gradual changes in teaching practice and study habits. Evaluations are expected to closely match course goals.

E. Course directors will be encouraged to use the facilities of the Office of Educational Development for examination planning and question writing.

F. In order to avoid any unconscious influence in setting standards, the course directors should arrange to grade examinations and set the passing scores without the knowledge of individual names.

G. At the completion of each course, the course director will forward a raw score and a grade of "honors, pass, fail" for each student to the Office of Academic Affairs. Modifiers, such as plus and minus, will be disregarded. A final grade for the Transition Course at the end of the second year, other than the subjective evaluation, will not be submitted. Any written evaluations submitted by course directors will become a permanent part of student's record and will be forwarded to the student's advisor.

H. Students will not be promoted to the next year of the curriculum until they have successfully passed all courses (see policy Student Promotions Committee Process).

II. In-course and End-of-Course Examinations

A. After each examination the course director, with the assistance of the Office of Academic Affairs, will calculate examination scores including the distribution, mean, standard deviation, weighting factors, and pass/honors levels. These will be provided to students by posting or other means according to the students' identification numbers. Final examination grades will be posted only after the end of the examination period.

B. The Office of Academic Affairs will forward this information to the appropriate Deans and class advisors for their respective advisees, and will maintain files for the use of the Student Promotions Committee (see policy Student Promotions Committee Process).

C. Course directors will retain records of all examination scores for one year; the Office of Academic Affairs will retain files of examination scores until the individual or class has graduated, or until a student has been officially withdrawn from medical school.

III. End of Course Grades

A. Course directors will report grades promptly to the Office of Academic Affairs for all students in a course according to the grading system shown below:

1. *Permanent grades: Honors (H), Pass (P), and Fail (F).*

   H—Honors, Clear Excellence
   P—Pass, Entirely Satisfactory
   F—Fail, Failed

2. *Temporary grades: IN, CO.*

   Absent compelling circumstances, a student who does not take an examination will be given a Failing (F) grade unless: (1) s/he is granted an administrative or medical excuse by the Associate or Assistant Dean for Academic Affairs prior to the exam (see the policies: *Excuse from Examinations—The Preclinical Years and Student Health Policy Relative to Medical Excuses);* (2) s/he is withdrawn from the course in good standing (see policy *Leave of Absence).* An excused absence must be converted into a permanent grade in time to allow review by the Student Promotions Committee.

   An Incomplete (IN) grade should be reported for a student who took the final examination, but who needs to complete some other work required in the course. Absent compelling circumstances, the grade of Incomplete must be converted into an Honors, Pass, or Fail grade within eight weeks after the beginning of the succeeding semester.

   The Condition (CO) grade is a temporary grade used only by course directors, with defined criteria for failed courses, when pass by an equivalent re-examination is considered likely. The equivalent re-examination should be offered within two weeks of the time that students are notified of their grades. The Condition grade designation remains on the transcript after the final grade is determined (i.e., CO/P). Students receiving a Condition grade cannot receive a final grade higher than a Pass.

B. The course director will advise the Student Promotions Committee of the criteria used to determine final grades in a course, i.e., examination scores, laboratory performance, subjective evaluation, etc.

C. Course directors should retain a copy of the grades for a course for at least one year.

D. Grades that are not used by course directors but are assigned administratively are:

BE—Credit by examination (see policy: *Credit by Examination—The Preclinical Years).*
NG—No Grade: Assigned instead of fall semester grades to those courses

which extend over more than one semester, and for which no fall semester grade is given.
Honors for the Year—Given by the Student Promotions Committee (see policy *Student Evaluation—The Preclinical Years, Section IV).*

E. The Office of Academic Affairs will:

1. Forward grades to the Registrar, Associate and Assistant Deans for Academic Affairs, the Associate Dean for Student Affairs, and the class advisors for their advisees.
2. Provide the Student Promotions Committee with all available data.
3. Issue grades to students.

F. The Registrar will record the letter grades and any subjective evaluation(s) in the student's permanent record.

IV. Honors for the Year

Honors for the Year in the first two years will be given to students who score in the top 15% based on a total weighted score. The total weighted score shall be calculated by taking the final numerical grade in each course, multiplying each grade by a weighting factor based on the percent of total contact hours that each course represents, and adding all the individual weighted scores. The numerical grade for courses in which only a letter grade and written evaluation are given will be created by assigning a number for each grade (Honors, Pass, Fail) using a mathematically appropriate and consistent procedure. *Selectives will not be included in the calculations to determine Honors for the year.*

The base used for calculating a total weighted score for students who have received credit by examination in one or more required course will reflect the reduced total contact hours. In this way, such students will have an equal chance with their classmates taking the full academic program for Honors.

Students in a decelerated program, those repeating a course(s), and others with special schedules because of academic difficulties will not be included in the calculation for Honors for the Year.

V. Failure

Students are required to pass every course in the first two years, and will not be promoted to the next academic year until they have successfully passed all courses and been reviewed by the Student Promotions Committee. In the event that a student fails one or more course(s), the Student Promotions Committee will decide whether the student should be allowed to enter a Summer Review Program and pass a re-examination to the satisfaction of the course faculty, enter a decelerated curriculum, repeat a whole or portion of the academic year, take a leave of absence with conditions upon return, or be dismissed from school. Students required to take a leave of absence must abide by the leave of absence policies (see policy *Leave of Absence*). For further information regarding failure of a course and its repercussions, please refer to the policy *Student Promotions Committee Process.* For additional information about the academic assistance programs and decelerated curriculum, please refer to the policy *Academic Assistance Program—The Preclinical Years.*

VI. Dismissal

If the student's overall performance (including academic performance, promise, fitness, and appropriate moral character) is considered unsatisfactory, the Student Promotions Committee makes what it considers appropriate recommendations, and counsels with the student about his or her difficulties. A student may be dismissed from medical school if, in the judgment of the Student Promotions Committee, he or she does not show sufficient promise to continue in Medical School. For further information regarding failure of a course and its repercussions, please refer to the policy *Student Promotions Committee Process.* For additional information about the academic assistance programs and decelerated curriculum, please refer to the policy *Academic Assistance Program—The Preclinical Years.*

VII. Student Promotions Committee

The Student Promotions Committee will apply the faculty standards regarding promotion, honors and dismissal from the School of Medicine. The committee, working with the Assistant Dean for Academic Affairs and the class advisor, will determine appropriate remediation when needed. The Student Promotions Committee will meet periodically to review course grades for all students, and decide on a plan to remedy the deficiencies of each student who has failed one or more courses. For further information about failure of a course or particulars about the Student Promotions process, please refer to the policies *Student Promotions Committee Process,* or *Appeal of a Student Promotions Committee Decision.*

VIII. Academic Assistance Program

The members of the Subcommittee to Evaluate Medical Students believe that the student evaluation program should be closely linked to a well-defined program of remediation for all students in need of academic assistance. We also believe that early recognition of the need for academic assistance will facilitate the correction of academic deficiency in the shortest possible time. We have organized the mid-point evaluation in the first semester with this in mind, so that students with unsatisfactory performances will be brought to the attention of their class advisors and the Assistant Dean for Academic Affairs early in their medical school experience. For further information on the Academic Assistance Program, please refer to the policy *Academic Assistance Program—the Preclinical Years.*

IX. Advisory Committee on the Preclinical Evaluation of Medical Students

The Advisory Committee on the Preclinical Evaluation of Medical Students provides analysis of examinations and direct feedback to the faculty, with implementation of suggestions in a timely fashion. The Advisory Committee on Preclinical Evaluation of Medical Students assumes the following responsibilities:

A. To serve in an advisory role in reviewing in-course examinations. Course directors will provide the committee with adequate course descriptions and teaching goals, as well as copies of examinations given, with the understanding that the content of an examination remains secure.
B. To meet after the midcourse and end-of-course examinations to review examinations and results.
C. To report findings to the Associate Dean for Academic Affairs and course directors.

X. Use of the National Boards (NBME) Examination, Part I

Medical students who have completed the second year curriculum will have the option of taking the National Board of Medical Examiners examination, Part I, at the certification time which falls in early June. The examination is not a requirement of the School.

2. STUDENT EVALUATION—THE CLINICAL YEARS

I. The Curriculum

A. *The Third Year*

The third year of medical school differs significantly from the first two years even though students have been partially exposed to the clinical environment. Students must complete five required basic clerkships in Medicine, Surgery, Pediatrics, Obstetrics and Gynecology, and Psychiatry. The Medicine and Surgery rotations are 12 weeks, and the Pediatrics, Obstetrics and Gynecology, and Psychiatry rotations are 6 weeks. Students will be exposed to both inpatient and ambulatory care settings, either at the University of North Carolina Hospitals or through the various AHEC sites.

The major concern of the faculty is that the basic clinical skills of students be more formally evaluated. The need to improve and focus the teaching and evaluation of basic clinical skills by direct observation has been recognized at this institution and by the American Association of Medical Colleges.

The nature of student evaluation in the clinical years differs from that of the preclinical years. Emphasis is placed on clinical activity and skills that require faculty to make judgments in the absence of strictly quantitative measures. Students have expressed a great need for more objectivity and direct feedback. They also feel that the current checklist evaluation system invites evaluators to grade attributes that have not been directly observed. Faculty have expressed concern regarding both the reliance on methods of evaluation depending on direct observation on a day-to-day basis, and the lack of quantitative measures of competence and knowledge. It is believed that the problem can best be resolved by laying down broad policies that promote fairness and openness, indicate the need to create specific criteria and standards by which clinical performance is judged, and at the same time improve communications between students and faculty.

B. *The Fourth Year*

The fourth year of medical school differs significantly from the three previous years. These unique considerations, listed below, have influenced the recommendations for an evaluation system for the fourth year.

1. The fourth year is comprised of 4-week courses, seven of which are required: an Acting Internship at one of the AHEC hospitals, a Preceptorship in Family Medicine, and five electives.
2. Students in the fourth year have gone through the screening of periodic examinations as well as other types of evaluation in the first three years. Students with deficiencies have received academic assistance, counseling, and in some cases, individually designed program modifications. Thus, it is presumed that deficiencies have been corrected before students are allowed to register for the fourth year (see policy *Academic Assistance—The Clinical Years*).
3. Students make contractual commitments to graduate training programs as early as autumn of the fourth year. All attempts should be made for students to successfully complete any prescribed remediation before July 1.
4. All students take at least two courses at sites other than Chapel Hill; many take several at AHEC sites and other institutions.
5. The major concern of the faculty is that the basic clinical skills

of students should be more formally evaluated. The development, testing and implementation of new or enhanced methods of teaching basic skills by each clinical department is encouraged. A prerequisite to this is the identification of those clinical skills to which third and fourth year medical students should be exposed, and which should be mastered before graduation. New methods designed to assess clinical competence are being developed by some departments, with the goal of improving the evaluation of clinical skills. The responsibility for setting the level of clinical competence in our students, and the means for assessing that competence, lies with the chair and faculty in each clinical department.

II. Student Evaluation

A. Evaluative procedures should be designed to promote learning, refine technical and clinical skills, train the minds of students, and assess basic competence.

B. Evaluation should be congruent with the goals and expectations of each course. Assessments in the following general areas should be clearly included in all course evaluations:

1. *Medical knowledge:* An assessment of the knowledge base should be developed by each clinical department.
2. *Clinical skills* (i.e., ability to do a physical examination, draw blood, etc.): The need to improve and focus the teaching and evaluation of basic clinical skills by direct observation has been recognized at this institution and by the American Association of Medical Colleges. The development, testing and implementation of new or enhanced methods of teaching basic skills by the clinical department is encouraged. A prerequisite to this is the identification of those clinical skills in each discipline to which the third and fourth year medical student should be exposed. The list of such skills will reflect the distinctive characteristics of each discipline. The Advisory Committee on the Clinical Evaluation of Medical Students will serve to support and coordinate such efforts.
3. *Clinical performance* (i.e., the ability to synthesize data, to work in a team, to interact appropriately with patients, etc.): Evaluation based on direct, day-to-day observation of the student in a clinical setting is the traditional, primary method of evaluation in medical school curricula. This method has stood the test of time, and heavy emphasis on this method is supported. Therefore, it is essential that experienced clinicians regularly observe students under their supervision in each clinical segment of each clerkship and each course as these students work with patients.

   It should be emphasized that this is the final opportunity to identify those students who are not fit to practice medicine for moral or psychological reasons. If a course director identifies a problem of this nature, he or she must immediately notify the Assistant Dean for Academic Affairs.

C. Course directors are encouraged to employ multiple evaluative techniques that they deem appropriate to the clinical tasks and expertise of their particular specialty area, and that reflect the goals and expectations of the course. The faculty are strongly encouraged to use methods other than NBME subtests to evaluate the fund of knowledge in a clinical discipline. These externally-prepared tests may not correspond to the stated goals and expectations of the course. A restriction on the use of NBME subtests is consistent with the policies adopted by the School of Medicine. Various approaches of evaluating cognitive knowledge are available, including the development of departmental examinations, selection from one of the question banks available for review, revision and local use, among others. The faculty of each course are encouraged to select the approach that best fits the needs of their discipline.

D. For third year clerkships, the weighting of the evaluations from the three areas (knowledge, clinical skills, and clinical performance) should be balanced in a manner deemed appropriate by the course faculty. Scores from short answer, written tests should contribute to no more than 25% to the total clerkship grade.

III. In-course Evaluation

A. At the start of each clerkship and elective, the student and evaluators should be explicitly informed about the following:

1. The goals and expectations of each segment or course;
2. The basis of evaluation during the segment or course;
3. Standards to be employed for the assignment of grades.

B. During each elective and clerkship, and whenever feasible during each segment of each clerkship, the faculty should provide feedback to each student on his or her performance, in an effort to help correct deficiencies and enhance strengths. For third year students, as part of the feedback, a mid-clerkship assessment should be conducted with each student by the attending faculty member in a personal meeting (i.e., at the end of the first 4-week segment in Medicine, at the end of two 3-week segments in Surgery and after three weeks of the 6-week clerkships). These assessments are analogous to the midcourse evaluations required in the first two years. For fourth year students, formal midcourse evaluations are not always possible; however attending faculty should meet frequently with students to keep them apprised of their progress. Students at risk of failing should be notified in writing at the time of the mid-course assessment; the Assistant Dean for Academic Affairs should receive a copy of such notifications so that appropriate assistance can begin. It is important that mid-course assessments be promptly transmitted to students.

IV. End of Course Grades

The following are the general guidelines for the reporting of grades and the maintenance of grading records in the third and fourth years of medical school.

A. Course directors will report grades promptly to the Registrar and the Office of Student Affairs for all students in a course, according to the grading system shown below. Grades for third year clerkships must be reported within 6 weeks after the completion of the clerkship, with the exception of Surgery grades that must be reported within 8 weeks after the completion of the clerkship. Grades for completed fourth year courses must be reported one month prior to graduation, so that a determination about graduation can be made by the Student Promotions Committee.

1. *Permanent grades: Honors (H), High Pass (HP), Pass (P), Low Pass (LP), and Fail (F).*

   H — Honors, Clear Excellence
   HP — High Pass, Above Average
   P — Pass, Entirely Satisfactory
   LP — Low Pass, Below Average
   F — Fail, Failed

2. *Temporary grades: IN, CO.*

   Absent compelling circumstances, a student who does not complete a clerkship or elective course will be given a Failing (F) grade unless s/he is withdrawn from the course in good standing, has received an Incomplete (IN) grade, or has received an excused absence from the Associate or Assistant Dean for Academic Affairs.

   INCOMPLETE: Students receiving a grade of Incomplete on a clerkship must remove it at the earliest possible time that the segment of the clerkship can be rescheduled, and no later than the end of the summer following the third year. Students receiving a grade of Incomplete in a fourth year course must remove it no later than one month prior to graduation.

   Students who take an elective prior to the fourth year and who receive an Incomplete on the elective must remove the Incomplete within two semesters, or it reverts to a grade of Fail.

   CONDITION: The use of the Condition grade is intended for students who demonstrate limited academic deficiencies. The grade should be used in the following manner.

   a. The grade of Condition (CO) may be assigned when it is determined by the course director or faculty that a student has demonstrated limited academic deficiencies that can be remediated within a limited period of time. The Condition grade can be assigned in lieu of a Low Pass or Fail grade.
   b. Examples of limited remediation may include retaking an examination that is equivalent to the objective examinations that are required for clinical course evaluations, an additional clinical experience, or a combination of an examination and additional clinical experience. An additional clinical experience will be limited to three to four weeks for a twelve-week clerkship and two weeks for a four to six-week course.
   c. The final grade will depend on the student's performance in the review. The final grade may be improved to CO/Pass. However, if the student's performance declines, this will be reflected in the final grade and course evaluation. Thus, if a student has an initial grade of Low Pass and fails the review, the final grade will be CO/Fail.
   d. If the student's academic deficiencies are not considered limited, the student's original grade will be recorded and a formal review will be designed by the course director, in consultation with the Assistant Dean for Academic Affairs and the student's class advisor. The student will receive an additional grade for the review and must pass the review before being promoted to the next academic year, or be graduated.

B. The course director will advise the Student Promotions Committee of the criteria used to determine final grades in a course, i.e., examination scores, clinical skills evaluation, subjective evaluation, etc.

C. Course directors should retain a copy of the grades for a course for at least one year.

D. Grades that are not used by the course directors, but are assigned administratively are:
   a. *No Grade* (NG) may be assigned when a clerkship or elective extends over more than one semester, and when a final grade has not been given.
   b. *Honors for the Year*—Given by the Student Promotions Committee (see policy *Student Evaluation—the Clinical Years, Section V*).

E. The Registrar and the Office of Student Affairs will forward grades and comments to the Office of Academic Affairs, which will provide the Student Promotions Committee with all available data, and issue grades to students and class advisors.

F. The Registrar will record the letter grades and any subjective evaluation(s) in the student's permanent record.

V. Honors for the Year

The Student Promotions Committee awards Honors for the third and fourth years based on the sum of honor credits received in all courses according to the following system:

1) *credit hrs. actual total
for each course x grade = weighted points

Based on a numerical scale:

Honors = 4
High Pass = 3
Pass = 2
Low Pass = 1

SAMPLE:
6 x 4 (Honors) = 24
6 x 3 (High Pass) = 18
6 x 2 (Pass) = 12
total weighted pts 54

2) credit hrs. highest possible total points
for each course x grade = possible

SAMPLE:
6 x 4 (Honors) = 24
6 x 4 (Honors) = 24
6 x 4 (Honors) = 24
total points possible 72

3) total weighted points /
total points possible = weighted score

SAMPLE: 54 / 72 = 0.75 x 100 = 75.0%

*NOTE: In the third year, the Pediatrics, Ob/Gyn and Psychiatry clerkships are 6 credit hours; the Medicine and Surgery clerkships are 12 credit hours. In the fourth year, the required Family Medicine Preceptorship, the Acting Internship and individual electives are usually 6 credit hours, but may occasionally be 12 credit hours.

No student who has failed a course is eligible for Honors for the Year. The Student Promotions Committee determines the minimum score of honor credits that must be achieved to earn Honors for the Year. It is recommended that no more than 25% of the third and fourth year class be awarded Honors for the Year.

VI. Failure

Students are required to pass every clerkship in the third year, the required Acting Internship Selective, the Family Medicine Preceptorship, and at least five one-month electives in the fourth year. In the event of failure of a third year clerkship, the student must satisfactorily complete the clerkship before promotion to the fourth year. In the event that a student fails more than one clerkship, the Student Promotions Committee will decide whether the student should be allowed to repeat the year, take a leave of absence with conditions, or be dismissed from school. Students required to take a leave of absence must abide by the leave of absence policies (see policy *Leave of Absence*). A student who fails a repeated clerkship will be dismissed from medical school. For fourth year students, any 'Incomplete' grade not resolved within a stated period of time, will become a Fail. Any course failure in the fourth year will be reviewed by the Student Promotions Committee, and a determination concerning proposed remedial work will be made at that time. A final grade in all attempted fourth year courses is required for receipt of the M.D. degree. For further information regarding failure of a course and its repercussions, please refer to the policy *Student Promotions Committee Process.* For additional information about the academic assistance programs and decelerated curriculum, please refer to the policy *Academic Assistance Program—The Clinical Years.*

VII. Dismissal

If the student's overall performance (including academic performance, promise, fitness, and appropriate moral character) is considered unsatisfactory, the Student Promotions Committee makes what it considers appropriate recommendations, and counsels with the student about his or her difficulties. The student may be dismissed if, in the judgment of the Student Promotions Committee, he or she does not show sufficient promise to continue in Medical School. For further information regarding failure of a course and its repercussions, please refer to the policy Student Promotions Committee Process. For additional information about the academic assistance programs and decelerated curriculum, please refer to the policy Academic Assistance Program—The Clinical Years.

VIII. Student Promotions Committee

The Student Promotions Committee will apply the faculty standards regarding promotion, honors and dismissal from the School of Medicine. The committee, working with the Assistant Dean for Academic Affairs and the class advisor, will determine appropriate remediation when needed. The Student Promotions Committee will meet periodically to review course grades for all students, and decide on a plan to remedy the deficiencies of each student who has failed one or more courses. For further information about failure of a course or particulars about the Student Promotions process, please refer to the policies *Student Promotions Committee,* and *Appeal of a Student Promotions Committee Decision.*

IX. Academic Assistance for Third Year Students

A program for academic assistance has been designed by the Subcommittee on Academic Assistance. The Subcommittee on Medical Student Evaluation supports the provision of timely and supplemental help to students, within the resources allocated for that purpose, to remedy specific difficulties, so that students can grow and reach their full potential in the clinical setting.

The provision of academic assistance should be based on the early identification of problems, preferably before the end of the first segment of a clerkship, or before the end of an elective. The Assistant Dean for Academic Affairs will work with the student and the clerkship director to develop an individualized program that is appropriate to the student's needs, is feasible to carry out within the structure of the clerkship or elective, is an approach judged to be likely to resolve the deficiency, and involves close monitoring by the Assistant Dean for Academic Affairs. The student's class advisor will be involved in the process (see policy *Academic Assistance—the Clinical Years*).

The subcommittee acknowledges that it is exceedingly difficult to implement an individualized program while a student is a part of the team of attending physicians, residents and other students providing patient care.

X. Advisory Committee on the Clinical Evaluation of Medical Students

The Advisory Committee on the Clinical Evaluation of Medical Students will meet periodically throughout the year to monitor the evaluation methods and results, support course directors in strengthening their evaluation, and report to the Associate Dean for Academic Affairs.

XI. Use of the National Board (NBME) Examination, Part II

Students have the option to take Part II of the NBME examination during or after completion of the third year; however, this examination is not a requirement of the School.

3. CREDIT BY EXAMINATION—THE PRECLINICAL YEARS

Students with advanced knowledge in a scientific discipline may, at the discretion of a medical school academic department, be given credit for a non-clinical medical course based on an examination, review of academic credentials and/or other type of evaluations, as deemed appropriate and adequate by the course faculty, course director, and departmental chair. Each department will establish written criteria for granting Credit by Examination. Course directors will report in writing to the Office of Academic Affairs, the names, examination scores when appropriate, and other documentation of those students who have successfully achieved credit by prior evaluation. The Registrar will record the credit in the student's permanent record and will cancel the student's registration in such course(s). The Office of Academic Affairs will maintain files of examination scores until such students graduate.

4. DECELERATION AT MATRICULATION

Students requesting to enter a decelerated curriculum at the time of matriculation to medical school, should submit a formal letter of request to the Assistant Dean of Academic Affairs. The letter should clearly state the rationale for such a request. A committee consisting of the Associate Deans for Student Affairs and Admissions, and the Associate and Assistant Deans for Academic Affairs will review the requests and make decisions. The decisions will be primarily based on the compelling nature of the request, and the school's ability to accommodate students based on the availability of space and other resources.

5. EXCUSE FROM EXAMINATIONS—THE PRECLINICAL YEARS

Students are expected to take all required examinations on the scheduled date. If a student cannot take a scheduled examination due to illness or other exceptional circumstances, it is the responsibility of the student to obtain the proper excuse from the examination.

Any student requesting to be excused from a first or second year midcourse or end-of-course examination must obtain an administrative excuse from the Associate or Assistant Dean for Academic Affairs prior to the examination. Examples of an administrative excuse are an illness of several days duration, or a family death or illness in the student's immediate family. In the case of acute (within 24 hours of the examination) illness, students should contact the Office of Academic Affairs to report the illness. When deemed appropriate, the student will be granted an administrative excuse, and the course director promptly notified. The student may be advised to seek treatment at the Student Health Service. The student will be expected to contact the course director within 24 hours to arrange a make-up examination. The course director will determine whether or not to offer a make-up midcourse examination (or end-of-segment examination in Mechanisms of Disease course). Midcourse examinations, when pertinent, and final examinations, must be made up as soon as the reason for the excuse is resolved, and at the convenience of the course director.

Guidelines for make-up examinations

1. The course/segment director should normally provide an equivalent make-up exam within a reasonable period of time.
2. The course/segment director should be allowed wide latitude in the type and format of the exam offered. Under the present honor code, and in situations where the exam could be given within 2 or 3 days, it might be possible to give the same exam. When this is not possible, the make-up exam need not be in the same format as the original. However, the make-up exam should be defensible as equivalent in any possible appeals of promotion decisions based on the outcome of that exam.
3. In those cases in which the exam in question is a midterm or an end-of-segment exam, and the final is cumulative, the course/segment director should have the option of dropping the exam. However, in such cases the course/segment director should provide some assessment of that student's progress so that assistance can be offered if necessary.
4. Whenever possible, the make-up exam should be scheduled so that it does not impede the normal scholastic progress of the student.
5. The syllabus for each course should specifically state the policy to be followed when a student has an excused absence from an examination.

6. STUDENT HEALTH POLICY RELATIVE TO MEDICAL EXCUSES

The University policy originally adopted by the Faculty Council in 1957, provides that University physicians not be asked to issue individual medical excuses for class absence. It further provides that the names of students admitted to the Student Health Service, and those known to be ill during final examinations, should be placed on the 'Infirmary List' that is distributed daily to the deans of all colleges. This policy continues to be followed by Student Health Service. Should an instructor need to know that a student was seen on an out-patient basis, this fact can be verified by contacting the Medical Records division of the Student Health Service. For reasons of confidentiality, no details of the visit can be released without written consent from the patient.

It has been demonstrated in many university settings that when a health service is regularly involved in the provision of medical excuses, an inordinate amount of professional time is consumed by that process. The provision of quality medical care is not compatible with an excuse-providing function. This view is shared by the American College Health Association and appears in its Recommended Standards and Practices.

Although students continue to claim that some faculty require a written medical excuse in order to schedule make-ups or avoid penalty for attendance reasons, this is counter to University policy. If University officials need to know more than the fact of a student's having been seen at the Student Health Service, further information can be released only at the student's request.

7. STUDENT PROMOTIONS COMMITTEE PROCESS

The following policy on the promotion of medical students has been approved by the medical school faculty and became effective during the spring of 1984. Students must pass all required courses to receive the M.D. degree. Students who fail any required course must eventually pass the course through re-examination, remediation and re-examination, or repeating the course and re-examination.

I. General Guidelines

A. The Committee is composed only of teaching faculty. Eight voting members are recommended, four from the basic science departments and four from the clinical departments. In selecting the members of the Student Promotions Committee, the Dean and the Associate Dean for Academic Affairs are urged to seek broad representation.

B. The Committee will be chaired by the Associate Dean for Academic Affairs who votes only to break a tie; there is one ex-officio (non-voting) member — the Assistant Dean for Academic Affairs. The decision of the Student Promotions Committee will be determined by majority vote. The appropriate class advisors, course directors and the Assistant Dean for Academic Affairs will be expected to provide information on each student, as may be required by the Student Promotions Committee to render informed decisions.

C. The Committee will review each student's academic performance during each semester, and at the end of each semester. If a student's academic performance is judged to be deficient during the semester, the Student Promotions Committee may recommend that the student participate in some form of academic assistance, take a decelerated curriculum, or both, or take a leave of absence with conditions. Students required to take a leave of absence must abide by the leave of absence policies (see policy *Leave of Absence*). The specific design of each student's remedial plan will be the responsibility of the Assistant Dean for Academic Affairs, working together with the class advisor (see policies *Academic Assistance — the Preclinical Years* and *Academic Assistance — the Clinical Years*).

D. The Committee is not permitted to change the evaluation of students performed by the course directors unless there is evidence of prejudice or malice (see policy *Appeal of a Course Grade*).

E. A student may appeal a decision of the Student Promotions Committee (see policy *Appeal of a Student Promotions Committee Decision*).

F. ***Dismissal.*** If the student's overall performance (including academic performance, promise, fitness, and appropriate moral character) is considered unsatisfactory, the Student Promotions Committee makes what it considers appropriate recommendations, and counsels with the student about his or her difficulties. He or she may be required to: perform specific remedial work and pass re-examinations in a matter satisfactory to the Student Promotions Committee; to repeat the year, or a portion thereof, in a manner satisfactory to the Student Promotions Committee; take a leave of absence with conditions; or be dismissed if, in the judgment of the Student Promotions Committee, he or she does not show sufficient promise to continue in medical school. Students required to take a leave of absence must abide by the leave of absence policies (see policy *Leave of Absence*).

II. The Preclinical Curriculum

A. Non-decelerated students with limited academic deficiencies, defined as failure of no more than 20% of the total course hours, will enter the Summer Review Program and sit for re-examination at the end of that program (see policy *Academic Assistance Program—the Preclinical Years*). If they successfully pass the course(s) in the Summer Review Program, they will be promoted to the next year of the curriculum. If they fail the course(s) in the Summer Review Program, they will be required to enter a decelerated curriculum (see policy *Academic Assistance Program—the Preclinical Years*).

B. The 20% rule may seem inordinately rigid, and exceptional circumstances may make strict application of the rule inconsistent with the best interests of the student and the School. Under extraordinary circumstances a non decelerated student failing between 20-25% of the first year courses may be admitted to the Summer Review Program. Circumstances which might apply are cited below as examples.

   1. A student who has failed 20-25% of his/her courses, but who has solidly passing grades in all other courses;
   2. A student who suffers an acute personal tragedy (death of a parent, divorce) that affected his/her performance during a circumscribed period of time.

C. A non-decelerated student who fails greater than 25% of the total course hours during the first or second year will not be allowed to participate in the Summer Review Program, nor be permitted to be re-examined at the end of the summer. These students will be placed in a decelerated curriculum and will not be eligible for promotion until the end of the next academic year, pending the successful completion of all courses (see policy *Academic Assistance Program—the Preclinical Years*).

D. Those students who need to repeat less than the entire first year, or who have not passed previously failed courses at the end of the Summer Review Program may, at the discretion of the Assistant Dean for Academic Affairs in consultation with the class advisor, be permitted to take one or more second year courses in addition to the completion of required first year courses.

E. Those students who need to repeat less than the entire second year, or who have not passed previously failed courses at the end of the Summer Review Program may, at the discretion of the Assistant Dean for Academic Affairs in consultation with the class advisor, be permitted to take one or more fourth year electives in addition to the completion of required second year courses.

F. No student will be required to repeat a course that s/he has passed, even if the student is placed in a decelerated curriculum, or has to repeat the year.

G. Students who are placed in a decelerated curriculum or who are asked to repeat the first or second year, must complete that year of the curriculum within two calendar years after the end of the academic year in which the student entered medical school. Failure to do so will lead to dismissal from medical school, unless there are extenuating circumstances that preclude the student's progress and that are approved by the Student Promotions Committee (see policy *Academic Assistance Program—the Preclinical Years*).

III. The Clinical Curriculum

For students with limited academic deficiencies, the Student Promotions Committee may recommend that s/he enter a remediation program (see policy *Academic Assistance Program – the Clinical Years*). The Assistant Dean for Academic Affairs will work with the student and the clerkship/elective director to develop an individualized program that is appropriate to the student's needs, is feasible to carry out within the structure of the clerkship or elective, is an approach judged to be likely to resolve the deficiency, and involves close monitoring by the Assistant Dean for Academic Affairs. The student's class advisor will be involved in the process.

In the event of a failure of a third year clerkship, the student must satisfactorily complete the clerkship before promotion to the fourth year. In the event that a student fails more than one clerkship, the Student Promotions Committee will decide whether the student should be allowed to repeat the year, take a leave of absence with conditions upon return from leave, or be dismissed from school. Students required to take a leave of absence must abide by the leave of absence policies (see policy *Leave of Absence*). A student who fails a repeated clerkship will be dismissed from medical school. For fourth year students, any "Incomplete" grade not resolved within a stated period of time will become a Fail. Any course failure in the fourth year will be reviewed by the Student Promotions Committee, and a determination concerning proposed remedial work will be made at that time. A final grade in all attempted fourth year courses is required for receipt of the M.D. degree. For further information about failure of a clinical course, please refer to the policy Student Evaluation – the Clinical Years.

8. APPEAL OF A STUDENT PROMOTIONS COMMITTEE DECISION

I. General Guidelines

A. The first level of appeal of a promotions decision will be back to the Student Promotions Committee.

B. A formal appeal to the Student Promotions Committee can be filed only after the Student Promotions Committee's official decision has been received by the student, and the student has consulted with his or her class advisor and the Associate Dean for Academic Affairs, or their designated representatives.

C. Written appeals should be submitted to the Associate Dean for Academic Affairs within five working days after the student has complied with the requirements stated in (B) above, but in any event not later than 20 calendar days after his or her receipt of the decision of the Student Promotions Committee. Copies of the appeal should be sent to the class advisor. In all appeals, the burden of proof shall fall upon the student.

D. Absent compelling circumstances, a student seeking in his or her appeal to participate in a review program, or to repeat a year, may start in the appropriate program pending a decision by the Student Promotions Committee on his or her appeal, if the appeal to that Committee will not be heard and/or decided prior to the beginning of the program in which the student wishes to participate. If the Student Promotions Committee decides favorably on the appeal, the student may proceed in said program. If the Committee's decision is unfavorable, the student may no longer participate in the program unless a further timely appeal is made to the Student Appeals Committee. If that appeal is unsuccessful, the student may not participate further in the program, even though a further timely appeal to the Chancellor is initiated by the student according to University regulations.

E. In view of the Student Promotions Committee's responsibility to the public, progress to the next level of promotion following a decision by the Student Promotions Committee denying such promotion, will not be permitted pending an appeal. If the student's appeal to progress to the next level of promotion is ultimately successful, the faculty will take all appropriate measures to assist the student in making up the work that was missed.

II. Bases for Appeal

A. Students in the preclinical curriculum, who have failed 25%, or less, of the total course hours, and who have been asked to decelerate or repeat the year, may ask the Student Promotions Committee to hear reasons why s/he should be permitted to participate in the Summer Review Program. As stated in the policy Student Evaluation - the Preclinical Years, students who fail greater than 25% of the total course hours are not eligible for the Summer Review Program.

B. The bases for an appeal are the following:

1) Arithmetical or clerical error;
2) Arbitrariness, possibly including discrimination based upon race, sex, religion, or national origin of student;
3) Personal malice.
4) Student conduct cognizable under the Instrument of the Student Government.

Students appealing a decision based on these grounds should clearly state the evidence by which they judge: (a) that an impermissible element existed in the decision, and (b) that such an element(s) influenced the decision to the detriment of the student.

C. Students who have been dismissed from medical school may ask the Student Promotions Committee to hear their appeal to remain in school; the bases for appeal are noted above. For further information about dismissal, please refer to the policies *Student Evaluation — the Preclinical Years, Student Evaluation — the Clinical Years, Student Promotions Committee Process, Section I,* and *Dismissal for Non-academic Reasons.*

III. Appeal of a Student Promotions Committee Decision to the Student Appeals Committee

A. If the Student Promotions Committee decision on appeal is unfavorable to the student, the student may appeal the decision within five working days to the Student Appeals Committee. The appeal should be in writing and should be submitted to the Associate Dean for Academic Affairs. The Dean has designated the Student Appeals Committee to hear both appeals of course grades (see policy *Appeal of a Course Grade*) and appeals of promotions decisions.

B. The primary function of the Student Appeals Committee is to review the process that the Student Promotions Committee uses in making its final promotions decision. If the Student Appeals Committee has questions about the process used by the Student Promotions Committee in making a final decision on a student's appeal, then the Student Appeals Committee may decide to hear the student's grounds for an appeal, as based upon the following:

1) Arithmetical or clerical error;
2) Arbitrariness, possibly including discrimination based upon race, sex, religion, or national origin of student;
3) Personal malice;
4) Student conduct cognizable under the Instrument of the Student Government.

C. The Student Appeals Committee shall be composed of six teaching faculty (three from the basic sciences and three from the clinical sciences), and chaired by the Associate Dean for Academic Affairs. The chair will vote only to break a tie. The decision of the Student Appeals Committee will be determined by majority vote.

D. A decision of the Student Appeals Committee with which the Dean concurs is final. If the Committee and the Dean do not concur, the Dean's decision is final. The student may then initiate a further appeal to the Chancellor, according to University regulations.

E. Absent compelling circumstances, a student seeking in his or her appeal to participate in a review program, or to repeat a year, may start in the appropriate program pending a decision by the Student Promotions Committee on his or her appeal, if the appeal to that Committee will not be heard and/or decided prior to the beginning of the program in which the student wishes to participate. If the Student Promotions Committee decides favorably on the appeal, the student may proceed in said program. If the Committee's decision is unfavorable, the student may no longer participate in the program unless a further timely appeal is made to the Student Appeals Committee. If that appeal is unsuccessful, the student may not participate further in the program, even though a further timely appeal to the Chancellor is initiated by the student according to University regulations.

F. In view of the Student Promotions Committee's responsibility to the public, progress to the next level of promotion following a decision by the Student Promotions Committee denying such promotion, will not be permitted pending an appeal. If the student's appeal to progress to the next level of promotion is ultimately successful, the faculty will take all appropriate measures to assist the student in making up the work that was missed.

9. APPEAL OF A COURSE GRADE

I. Appeal to the Course Director

The first level of appeal of a course grade will be to the course director. Should the course director determine that there is a reason to change the course evaluation in the student's favor, the instructor should send an appropriate revision to the Office of Academic Affairs. If no reason for change is found, the faculty member should inform the student that the evaluation will stand.

II. Appeal to the Student Appeals Committee

In the event that the course director does not concur with the student's appeal, the student may pursue a second level of appeal (a formal appeal) to the Student Appeals Committee. The appeal can be filed only after official course grades have been received by the student, and the student has consulted with the course director and his or her class advisor, or their designated representatives.

III. Grounds for Appeal

Formal appeals can be considered only when the appeal is based on one or more of the following grounds:

A. Arithmetical or clerical error;

B. Arbitrariness, possibly including discrimination based upon race, sex, religion, or national origin of the student;

C. Personal malice;

D. Student conduct cognizable under the Instrument of the Student Government.

IV. Initiating an Appeal

Written appeals should be submitted to the Associate Dean for Academic Affairs within five working days after the student has complied with the requirements stated in Sections A & B above, but in any event not later than 20 calendar days after his or her receipt of the course grades. Copies of the appeal should be sent to the course director and to the class advisor. The appeal should clearly state the reasons by which the student judges: (a) that an impermissible element existed in the decision, and (b) that such element(s) influenced the decision to the detriment of the student. The burden of proof shall fall upon the student. Absent compelling circumstances, a student may proceed with his/her academic program, pending the results of an appeal to the Student Appeals Committee.

V. Final Decision of an Appeal

A decision of the Student Appeals Committee with which the Dean concurs is final. If the Committee and the Dean do not concur, the Dean's decision is final.

10. DISMISSAL FOR NON ACADEMIC REASONS

If the student's overall performance (including academic performance, promise, fitness, and appropriate moral character) is considered unsatisfactory, the Student Promotions Committee makes what it considers appropriate recommendations, and counsels with the student about his or her difficulties. He or she may be required to perform specific remedial work and pass re-examinations in a matter satisfactory to the Promotions Committee; may be required to repeat the year, or a portion thereof, in a manner satisfactory to the Student Promotions Committee; may be required to take a leave of absence with conditions; or may be dismissed if, in the judgment of the Student Promotions Committee, he or she does not show sufficient promise to continue in medical school. For further information about the promotions process, please refer to the policies *Student Promotions Committee Process* and *Appeal of a Student Promotions Committee Decision*. Students required to take a leave of absence must abide by the leave of absence policies (see policy *Leave of Absence*).

11. ACADEMIC ASSISTANCE—THE PRECLINICAL YEARS

I. General Guidelines

A major goal of academic assistance should be to promote active learning on the part of students, and to identify academic problems in the early stages. Using the Admissions Committee's criteria for categorizing purposes, any accepted students identified as likely academic risks will be encouraged to attend the MED Program prior to matriculation, or to take advantage of other experiences that may help them prepare for the first year of medical school. Students who do poorly in the MED Program (or poorly in other programs) will also be considered risk students.

During the academic year, methods used to identify students experiencing academic difficulties will include self-assessment evaluations, required course examinations, and observation of the student's performance by course faculty and/or class advisors. Course directors may give voluntary self-assessment tests, or students may use computer item banks, available through the Medical Sciences Teaching Labs (MSTL), to determine their level of mastery of course material and to identify problems with learning the course content. There should be at least one opportunity for self-assessment in courses that extend over a long period, and/or account for a substantial portion of the total course hours in an academic year. The content of self-assessment exams should be closely tied to the goals of the course. If the self-assessment exams are either graded by the faculty, or the faculty have knowledge of students' performances, the Assistant Dean for Academic Affairs, provided with these results, will meet with students who demonstrate academic problems, to discuss whether academic assistance is needed. Students, after discussions with the Assistant Dean for Academic Affairs, have the right to initiate, or decline, offers of academic assistance during the early stages of a course.

Required mid-term or end-of-course exam failures will serve to identify students at academic risk. At this point, students have demonstrated actual problems with course content that may portend difficulty with other subject matter. Academic assistance will be offered as needed, based on discussions between those students, the course director, the student's class advisor and the Assistant Dean for Academic Affairs.

Direct observations, made by course directors, faculty, or class advisors, of students' academic performance and participation in courses may identify students at risk of academic difficulty. Attention should be given to signs indicating possible academic problems i.e., psychological factors, withdrawal, difficulty responding to content related questions, absenteeism, marginal performance on exams or other criteria.

II. Forms of Academic Assistance

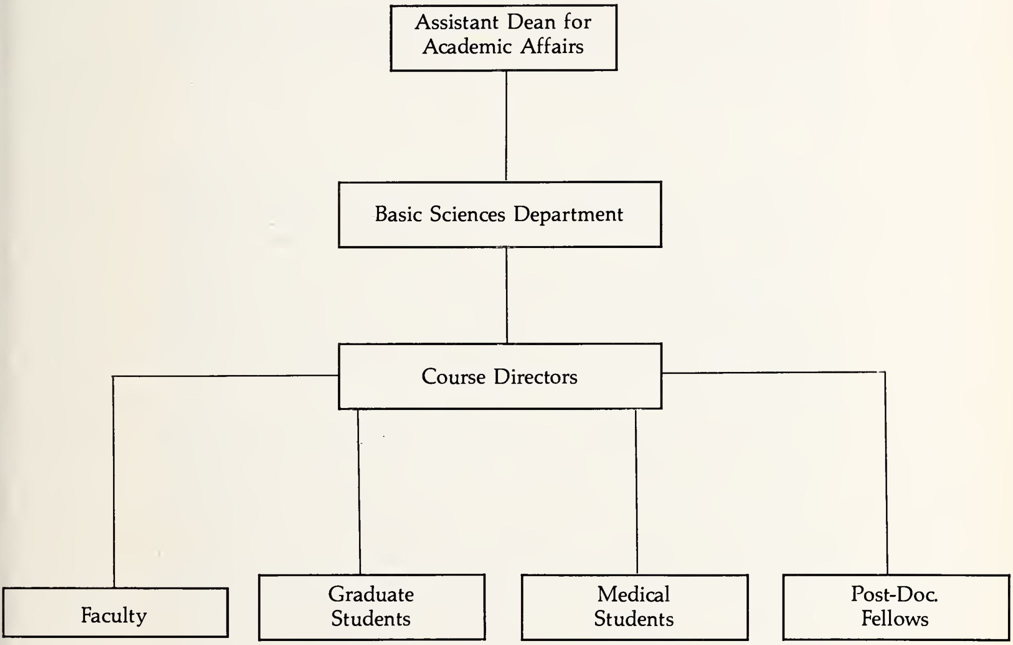
There are several types of academic assistance. The course faculty, who are responsible for the course content with which a student is having difficulty, continue to provide the primary assistance. Students should be encouraged to seek help from faculty as soon as, and as often as, questions arise. If a student feels s/he is having difficulty understanding the course content in general, s/he should be encouraged to meet with the course director, and together decide on the appropriate method of assistance. Methods may include regular meetings with the course director or other course faculty, directed reading assignments, special problem-solving practice, or working with a group of students with faculty support.

A. *Tutorials*

One formal means of offering academic assistance is the establishment of tutorials for students designated as having academic problems by the Assistant Dean for Academic Affairs. The tutorials can be led by faculty, graduate students or medical students, and are defined as special sessions focusing on content for an individual student or a small group of students. The decision on whether the tutorials will be offered in small groups or in an one-to-one setting will be based on the resources of the department or the medical school, and the needs of the students. Tutorials will be under the direction of the course director. If graduate or medical students serve as tutors, they should be chosen by the course director and should meet regularly with him or her. The organizational structure in Figure 1 is the suggested format for the tutorial program.

Figure 1

Tutorial Program Organizational Structure



If resources are available, graduate and medical students who serve as tutors should be paid. If this is not possible, these student-tutors should receive some other recognition for their service.

B. ***Monitoring and Evaluation***

Students receiving academic assistance will be monitored by the Assistant Dean for Academic Affairs, involved course directors, and the students' class advisors, in order to follow the students' progress and to evaluate the effectiveness of the type of academic assistance being provided. Course directors should feel free to use innovative methods for giving academic assistance, but should also inform the Assistant Dean for Academic Affairs of any new approaches being used. Similarly, the Assistant Dean for Academic Affairs should be able to suggest effective methods for academic assistance to the course directors.

C. *The Learning and Assessment Laboratory*

The Learning and Assessment Laboratory (LAL) provides an array of services for medical students, including academic counseling, self-assessment materials, review materials, stress management, test-taking skills, study skills, time management, learning strategy implementation, and note taking techniques. The LAL routinely conducts workshops for medical students on various learning skills topics. Students may refer themselves to the LAL program for individual assistance and may work individually, or in groups, with the LAL staff. Students who demonstrate academic problems are routinely referred to the LAL for evaluation and assistance.

D. *University Resources*

1. *Evaluation for Specific Learning Disabilities:* The University Counseling Center has a professional staff that evaluates students for specific learning disabilities. Students who are experiencing significant academic difficulty that is inconsistent with their documented aptitude and their efforts to perform academically, may be referred for evaluation at the Center. If an identified learning disability is remediable in the medical school learning environment, every effort will be made to accommodate the student's academic needs. Students who are identified with a learning disability may register with the Office of Handicapped Student Services to use the resources of that Office or the University.
2. *Reading Skills:* To master the medical school curriculum one must read a voluminous amount of course and supplementary materials. The University Reading Program provides services for students to improve their reading skills by increasing both their reading speed and comprehension. The program is self-paced and allows students to establish their own schedule for using the program resources.
3. *Writing Skills:* Effective communication in medicine requires both oral and written skills, and the medical school curriculum has increased the emphasis on effective writing skills. Students who wish to improve their writing skills, or students who are identified by faculty as needing assistance with their writing skills, may use the Writing Center (Phillips Annex by appointment only, the Undergraduate Library for walk-ins). Advanced graduate students are available to work with students on writing style, syntax, organization, grammar or specific written assignments.

E. *Summer Review Program*

This is an individualized summer program offered at the end of the first and second year for those students with limited academic deficiencies. Students eligible for this program will have failed no more than 20% of the total course hours in an academic year. Students who demonstrate passing scores on a re-examination of their failed course(s) at the end of the Summer Review Program, will be promoted to the next year of the medical school curriculum without delay. Of necessity, students who fail these re-examination(s) would become eligible for a decelerated program. Course directors will set the standards for passing a re-examination, and these standards must be similar to the standards established at the end of the course.

F. *Deceleration*

This program is appropriate for individuals with academic deficiencies that are broader than those of students admitted to the Summer Review Program. Students who are unable to complete the decelerated program successfully, are likely to be dismissed from medical school.

1. *First Year.*

Students having serious academic difficulties after the first half of the first semester may be advised to enter a decelerated program. Students failing 20% or more of the course hours in the first semester of the first year are likely to begin a decelerated curriculum in January of their first year, on the recommendation of the Student Promotions Committee (see policy *Student Promotions Committee Process*). The rationale for offering (and in some cases requiring) certain students the opportunity to spread out their first year course load over as much as two years was clearly stated in the Final Report of the Curriculum Review. A decelerated curriculum would be individually designed by the Assistant Dean for Academic Affairs, the student, and his or her class advisor. The student would continue to be eligible for the special academic assistance programs. A decelerated first year curriculum is designed to be completed in no more than two years.

Students beginning a decelerated curriculum in the second semester of their first year of enrollment might be allowed, at the discretion of a course director and the Assistant Dean for Academic Affairs, to remedy at least one course deficiency by self-study and re-examination. In addition, if the student passes all second semester courses included in the decelerated program, s/he should be allowed to remedy some of the remaining first semester deficiencies during the summer, at the discretion of the course director and the Assistant Dean for Academic Affairs. Alternatively, with prior approval by the course director, students could take a course(s) at another institution during the summer to satisfy School requirements. Students in a first year decelerated program may be allowed, under certain circumstances and with the recommendation of the Assistant Dean for Academic Affairs, to take one or more second year course(s) during the second year of the first year program.

Students who are in the second year of a first year decelerated program should be allowed to take second year courses or selective seminars, with the approval of the Assistant Dean for Academic Affairs and relevant course directors. A list of such courses might include, but should not be limited to the following: Psychiatry, which occurs throughout the entire year; Epidemiology, which takes place in the first semester; and Genetics, which takes place in the second semester. This recommendation would apply only for decelerated students whose progress would allow them to take some second year courses. Permission for a student to take second year classes is given by the Assistant Dean for Academic Affairs, who will consider the student's performance in the first year as one of the factors in his/her decision. The option of taking second year courses during the second year of a first year decelerated period would depend on each eligible student's schedule of the first year course load. This option, when appropriate, will effectively reduce the course load for students during their second year (their third year of medical school enrollment).

To provide a decelerated second year to those decelerated first year students unable to take second year courses in the second year of their first year curriculum, the Assistant Dean for Academic Affairs may offer the option of spreading the second year curriculum over three semesters. The availability of this option would be limited by the constraints of clerkship and clinical elective scheduling. Under the advice or request from the Assistant Dean for Academic Affairs, students might take a reduced load during the second year by postponing courses such as Epidemiology and the selectives, and taking these in the following fall (their fourth year of medical school enrollment). These students would delay their clinical clerkships until January.

Students in a decelerated program should be monitored closely by their class advisors and the Assistant Dean for Academic Affairs to forestall recurrence of academic problems.

Students who are not in serious academic difficulty, may request a special decelerated program, contingent upon: (1) approval of the Assistant Dean for Academic Affairs, and (2) the ability of the School to accommodate additional individual decelerated programs within its curriculum.

2. *Second Year.*

Deceleration during the second year will not be mandatory. If deceleration occurs, it will be voluntary, based on requests from students or advice from the Assistant Dean for Academic Affairs. If a student decelerates because of academic problems during the second year, deceleration will begin in the second semester. For example, students who have failed 40% or more of the course work in the first semester of the second year may be counseled to participate in a decelerated program. One method for decelerating the second year is to allow students to drop one of the courses such as Pharmacology, Pathology or Mechanisms of Disease, and not take any selectives during that semester. Students who consider such deceleration should be fully informed by the Assistant Dean for Academic Affairs of the School's policy regarding evaluation of students (see policy *Student Evaluation — the Preclinical Curriculum*).

Students repeating the second year will be provided with academic assistance under the direction of the Assistant Dean for Academic Affairs.

III. Additional Recommendations and Comments

Students experiencing academic difficulty should be screened to see that personal, financial or emotional problems, or physical illness are not factors in the observed academic problems. In some cases, students may be counseled to take a leave of absence to resolve personal, financial or medical problems. If allowed to do so, the student must comply with the requirements for a leave of absence (see policy *Leave of Absence*).

There should be regular communication among various support sources (course directors, class advisors, the Assistant Dean for Academic Affairs, and the staff of the Learning Assessment Lab), who are working with individual students.

All students should be encouraged to form learning teams. For many students, teams often promote learning and enhance performance. Some courses might present exercises to demonstrate the usefulness of learning teams in enhancing learning and performance.

Finally, the number of students needing academic assistance under the new curriculum may be smaller than anticipated. This may be due to the improved preparation of students for medical school, and to the more effective teaching methods and student assessment procedures that are taking place under the new curriculum.

IV. Obtaining Tutorial Assistance

A. Students who have specific questions or misunderstandings about course material should speak with the lecturer who presented the material, or the faculty or the teaching assistant who is assigned to their lab for that particular course.

B. Students who have more significant problems with course content should meet with the course director to discuss their individual problems and needs. The student and the course director should decide on the appropriate method to help the student approach and understand the course material.

C. If the course director feels that the student is having significant problems with the course content that merits individual tutorial assistance, the course director should refer the student to the Assistant Dean for Academic Affairs so that arrangements can be made to hire a tutor for the student. Tutors will be certified by the course directors.

D. Once a tutor is identified, the student and tutor will arrange to meet 2-4 hours per week to review the course material, and to deal with the student's academic problems in the particular course. Tutors will be paid by the Office of Academic Affairs and will be paid for a maximum of four hours per week. If the student requires more than four hours per week of tutorial assistance for a particular course, he/she will be responsible for paying the tutor for the additional hours. The week for tutorial assistance begins on Sunday a.m. and ends on Saturday p.m.

E. Students may discontinue their tutoring sessions whenever they feel they can master the course material without such assistance.

F. Students who have difficulty with their tutor should report this to the Office of Academic Affairs.

G. Tutors will be required to submit monthly reports of the student's academic progress to the Office of Academic Affairs. If the student is not making adequate progress, the student will be referred to the Assistant Dean for Academic Affairs for advisement.

H. Students who participate in the tutoring program will be requested to submit to the Office of Academic Affairs, an evaluation form on the effectiveness of the program at the end of each semester. Students who do not return these evaluation forms will not be eligible for tutorial assistance in future courses.

I. Students should maintain monthly contact with the director of the course in which they are having academic difficulty, to assess the adequacy of tutoring sessions as to their content and pacing.

J. Before a student is assigned to a tutor, s/he must sign a Tutoring Program Agreement which indicates that the student understands the policies of the tutoring program and will abide by these policies. If the student does not abide by these guidelines, s/he will be responsible for reimbursing the tutor. Students receiving tutorial assistance are expected to participate in all formal coursework.

K. All interactions between tutors and students will be strictly confidential.

12. ACADEMIC ASSISTANCE—THE CLINICAL YEARS

I. General Guidelines

The process of academic assistance will involve those students identified as needing such assistance. Included in the decisions regarding appropriate academic assistance formats for students will be their class advisors, the third year clerkship director or faculty assigned by the clinical departments for the fourth year, and the Assistant Dean for Academic Affairs, who will direct the Academic Assistance Program.

As in the first two years of the curriculum, once a student has been identified and academic assistance is offered, this student bears the primary responsibility for seeking and following up on the assistance programs.

II. Identifying Students Who May be at Risk of Experiencing Academic Difficulties in the Clinical Years

A major objective of the academic assistance program is to address, in advance, those factors that may result in academically related problems. Any students so identified will be offered academic assistance at the outset of the third year. Students who experienced academic difficulty in the first or second year, and who are believed to be at risk with regard to the third year curriculum, are monitored by the Assistant Dean for Academic Affairs, and are offered available academic assistance as needed.

With regard to the third year, the Academic Assistance Program accepts the statement contained on page 178 of the report of the Task Force to Review the Curriculum of the Medical School: "Once into the clinical years students have less time to address academic problems since learning at this stage is very unstructured and since students have the additional responsibilities of patient care." Thus, every effort should be made before the third year to correct severe deficiencies or personality problems that may interfere with academic performance.

Performance in both the Mechanisms of Disease and Physical Diagnosis courses might prove to be good indicators of performance in the third and fourth years. Thus, special attention will be paid to those students who have had passing, but borderline grades, or selective deficiencies in either of these courses. In addition, attention will be given to students who had marginal or unsatisfactory performances in the Transition Course. Such students, who are identified as being at risk, could then receive guidance and advice about self study, and/or about the possibility of tutorial assistance from faculty, residents, fellows, or in some instances, selected medical students. Further, students identified as being at risk should meet with the Assistant Dean for Academic Affairs and their class advisors during the period between the second and third years. Thus, pre-third year advising can occur during the time of the Transition Course. This advising procedure should ensure that a combined effort by the Assistant Dean for Academic Affairs and students' class advisors will establish early attempts to mitigate potential problems that may occur during the clerkships. Moreover, the Transition Course small group preceptors might participate in providing academic assistance before the third year. Clerkship Directors or designated faculty will be notified of students who are identified as having potential academic difficulties.

III. Determining the Causes for Academic Problems During the Clinical Curriculum

A. ***Noncognitive Factors.*** It is essential to try to determine the source of problems for students seemingly in need of academic assistance. Difficulties may stem from cognitive factors or from noncognitive factors, such as emotional, health, or personal problems that adversely affect academic performance in the clinical environment. The Assistant Dean for Academic Affairs and the student's class advisor will serve as resources and provide referral, when indicated, for problems that affect academic performance and are determined to be due to emotional, personal, health, or behavioral problems. The Offices of Academic Affairs and Student Affairs will work jointly in addressing these problems. In some cases, students may be counseled to take a leave of absence to resolve personal, financial or medical problems. If allowed to do so, the student must comply with the requirements for a leave of absence (see policy *Leave of Absence*).

The student's class advisor, the student, the Assistant Dean for Academic Affairs, and the Associate Dean for Student Affairs can, with special consultation, decide on the student's particular needs and the type of assistance indicated. The clerkship director will not be directly involved in assistance relative to noncognitive problems, but will provide assistance with scheduling and other matters so that identified students can take advantage of resources available to them.

B. ***Cognitive Factors.*** Regarding cognitive problems, every effort should be made to identify the source, i.e., deficiencies in basic sciences knowledge, bedside skills, technical skills, integrative skills, problem-solving, communication skills, or interpersonal skills. The type of academic assistance provided should be tailored to the needs of the individual student, and will be determined jointly by the Assistant Dean for Academic Affairs, the student's class advisor, the clerkship director, and the student. Available forms of academic assistance should range from advice concerning self study and information management, to tutorials with the ward team or with specially assigned faculty, residents or fellows. For some situations, it may be decided that a period of intensive remediation with separate tutoring sessions may be appropriate.

IV. Identification of Academic Problems During Clinical Clerkships

Students with academic problems should be identified as early as possible during the course of a clerkship. Students should be provided with timely feedback. This feedback should take the form of a personal conversation with either the clerkship director or an attending faculty member at the mid-point of the clerkship, unless the structure or duration of a clerkship prohibits this. This evaluation will guide students who are identified as marginal or failing in their clinical performance. It will also be beneficial to students who have performed well, and will encourage them to reach their full potential.

The mid-clerkship evaluation forms of all students who have a "low pass" or "failing" grades should be promptly forwarded to the Office of Academic Affairs. Those students should be immediately notified by the Assistant Dean of Academic Affairs of a meeting that will include the student's class advisor and the clerkship director. Notably, some students in need of academic assistance may only need assistance during a specific clerkship. Therefore, time should be allowed to provide students with appropriate academic assistance and to address identified problems or deficiencies during that period. Thus, there should be sufficient time for students to demonstrate acquired knowledge or actual need of academic assistance.

A special concern is that of students who have limited academic deficiencies that, although not severe enough to warrant a marginal or failing grade, may interfere with their performance and clinical development in later rotations. Therefore, regular channels should be established so that faculty can freely comment about such student deficiencies to the class advisor and to the Assistant Dean for Academic Affairs. These comments will be used to facilitate teaching and remediation and are not intended to become part of the permanent record. In some cases, however, depending on the nature and severity of the problem, it may be necessary for the comments to become part of the permanent record. The specific details of such a notification system should be formulated by the Associate and Assistant Deans for Academic Affairs.

V. Forms of Academic Assistance During the Clerkship

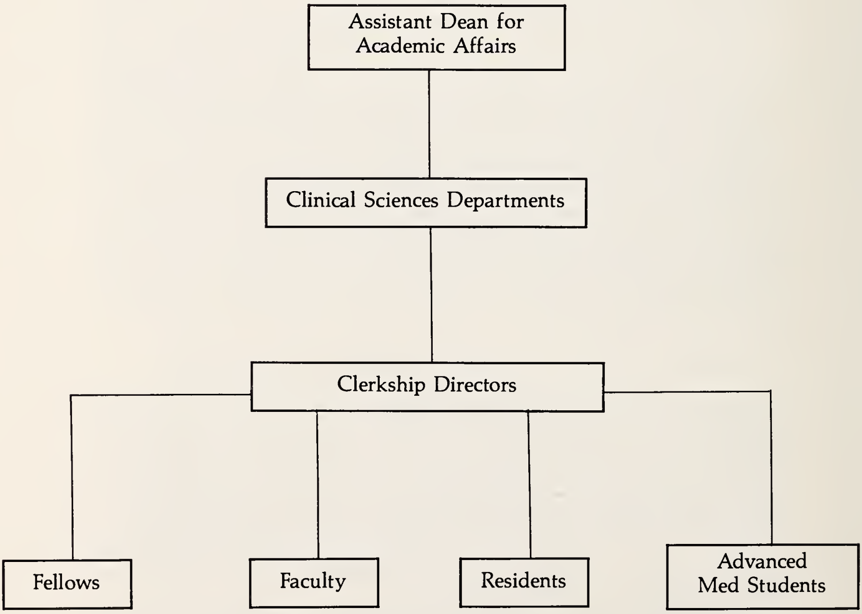
For some students experiencing academic difficulty early in a clerkship, before the formal mid-clerkship evaluation, the clerkship director should discuss the situation with the faculty preceptor (ward attending), the house officer, and the student to establish a plan to address any identified problems. But if the clerkship director believes that he cannot effectively manage a particular problem, he should immediately contact the Assistant Dean for Academic Affairs, who will notify the student's class advisor. The Assistant Dean for Academic Affairs, the student's class advisor, and the student can plan a program of academic assistance.

If the Assistant Dean for Academic Affairs becomes involved at the request of a clerkship director or after the mid-clerkship student evaluations, it is recommended that he meet with identified students and use information obtained from the clerkship directors for making decisions regarding academic assistance. Once the problem is called to the attention of the Assistant Dean for Academic Affairs, the student's class advisor will immediately participate, along with the clerkship director, in any deliberations concerning forms of offered academic assistance.

Using information gained from discussions with the clerkship director, the student's class advisor, and the student, the Assistant Dean for Academic Affairs will arrange the type of academic assistance that best addresses the student's problem. He should use available resources to assist students in overcoming deficits or in acquiring skills needed for subsequent success in their clinical training. An example of an academic assistance structure related to clinical tutorials is displayed in Figure 2.

Figure 2

Clinical Tutorial Program Organizational Structure


Assistant Dean for Academic Affairs
Clinical Sciences Departments
Clerkship Directors
Fellows
Faculty
Residents
Advanced Med Students

VI. Academic Assistance for Students Who Have Failed a Clinical Clerkship

Students who have received a failing grade in a clinical clerkship may be required by the Student Promotions Committee to repeat all, or part of, the clerkship before being promoted to the fourth year. The Student Promotions Committee, with advice from the Assistant Dean for Academic Affairs and the class advisor, should review the record of any student having a marginal or low pass grade to decide whether any remedial action should be taken.

The following are recommendations regarding repetition of all, or portions of, a clerkship:

A. There should be a faculty preceptor assigned by the clerkship director to monitor the student's progress during the rotation, and to ensure that his or her problems and deficiencies are properly addressed.
B. The ward experience should not merely be a repeat of the clerkship. Every effort should be made to assign the student to rotations that will give him or her a broad, representative experience under the preceptorship of residents and faculty who will ensure that the students receive proper guidance, supervision and evaluation.
C. The faculty, fellows, and residents working with such students should be aware of their specific deficiencies, so that they can effectively help the students to ameliorate deficiencies.
D. The task of constructing a remedial program should not be left entirely to the clerkship director.

Several topics and skills that should be emphasized and evaluated during a remedial period are: 1) the ability to retrieve and interpret information from the literature over a short time period, as needed for patient care; 2) the ability to obtain a history and perform a complete physical examination in an efficient and timely fashion; 3) the ability to elicit and interpret abnormal physical findings; 4) communications skills including the ability to summarize and present complicated medical information; 5) the ability to integrate clinical information and laboratory data to formulate a differential diagnosis; 6) the ability to apply pathophysiological principles in the clinical setting; 7) knowledge of principles of therapeutics; 8) appropriate interpersonal skills; and 9) appropriate attitudes and habits.

At the end of the remedial clerkship, students should be evaluated for clinical skills, clinical performance, and fund of knowledge. Satisfactory completion of a remedial clerkship should require a passing grade in each of those three areas.

VII. Sharing Prior Clerkship Performance Information with Succeeding Clerkship Directors

Clerkship directors or designated departmental faculty will be notified of any students who may need additional academic assistance as they begin their third year. Identification of such students will be based on the outcome of the preclerkship advising system as described above. The student's progress will be closely monitored by the Assistant Dean for Academic Affairs, and intervention will be carried out as deemed appropriate.

Further, the Assistant Dean for Academic Affairs should be allowed discretion about providing information. For example, if the Assistant Dean for Academic Affairs believes that a particular student will not benefit by having a succeeding clerkship director informed of the student's past performance, he will have the option of not sharing the information. However, performance in subsequent clerkships should be followed closely by the student's class advisor and the Assistant Dean for Academic Affairs to detect persisting problems. Should such problems exist, the Assistant Dean for Academic Affairs will have a discussion with the appropriate clerkship director regarding the student's previous related problems.

VIII. Academic Assistance During the Fourth Year

Given the elective nature of the fourth year, and because many of the courses are organized at the divisional rather than departmental level, clinical departments should have a designated person, i.e., Vice-Chairman for Academic Affairs in the Department of Medicine, or a special committee, to provide academic assistance for students with perceived academic deficiencies in the fourth year. Any remedial experience requested by the Student Promotions Committee or the Assistant Dean for Academic Affairs should be tailored to the specific needs of the student. The experience should be individually based and involve extensive contact with one, or preferably several faculty members, residents, or fellows. The experience should be at a level beyond that of the clinical clerkships and should include carefully supervised patient care responsibilities.

To receive a passing grade for any remedial experience in the fourth year, the student should exhibit knowledge, clinical skills, problem-solving skills, technical skills, and bedside skills appropriate for a person who is about to graduate. Given the decision that the Student Promotions Committee may have to make regarding graduation, it is essential that the student's clinical skills be assessed in a comprehensive manner.

13. CODE OF STUDENT CONDUCT

It shall be the responsibility of every student at the University of North Carolina at Chapel Hill to obey and to support the enforcement of the Honor Code, that prohibits lying, cheating or stealing when these actions involve the academic processes, or University student or academic personnel acting in an official capacity.

It shall be the further responsibility of every student to abide by the Code; namely, to conduct oneself so as not to significantly impair the welfare or the educational opportunities of others in the University community.

Student Responsibilities

To conduct all academic work within the letter and spirit of the Honor Code, that prohibits the giving or receiving of unauthorized aid in all academic processes.

To consult with faculty and other sources to clarify the meaning of plagiarism; to learn the recognized techniques of proper attribution of sources used in the preparation of written work; and to identify allowable resource materials or aids to be used during an examination or in completion of any graded work.

To sign a pledge on all graded academic work certifying that no unauthorized assistance has been received or given in the completion of the work.

To comply with faculty regulations designed to reduce the possibility of cheating, such as removing unauthorized materials or aids from the room and protecting one's own examination paper from view to others.

To maintain the confidentiality of examinations by divulging no information concerning an examination, directly or indirectly, to another student who has yet to write that same examination.

To report any instance in which reasonable grounds exist to suggest that a student has given or received unauthorized aid in graded work. Such a report should be made to the Office of the Student Attorney General or the Office of Student Affairs.

To cooperate with the Office of the Student Attorney General and the defense counsel in the investigation and trial of any incident of alleged violation, including the giving of testimony when called upon.

Extracted from the Instrument of Student Judicial Governance, pp. 6-7.

14. POLICY ON IMPAIRMENT OF MEDICAL STUDENTS DUE TO SUBSTANCE ABUSE

I. Purpose

Physician impairment, due to alcohol and other substance abuse, has been increasingly recognized as a significant problem nationwide. Research suggests that 12-14% of all practicing physicians are, or will become, impaired during their careers. Of particular importance to medical students as future physicians, is the fact that a large percentage of these impaired physicians report that impairment began during their undergraduate or graduate years of training. The purpose of this program is to reduce the number of impaired physicians by treating and preventing impairment that may begin during medical school.

II. Guidelines

A. As stated in the policy on promotions, in view of its responsibility to the public, the medical faculty will exercise its obligation to dismiss any student from the Medical School "...if the student does not in the judgment of faculty show sufficient promise, fitness, or appropriate moral character to justify his or her continuing in the study of Medicine regardless of academic performance". In this context, impairment, and in particular, impairment due to substance abuse, is not compatible with fitness.

B. It is understood that judgments about whether a student has a problem with substance abuse or chemical dependence, or is impaired, will need to be made. In this context, substance abuse and/or chemical dependence will be distinguished from substance use. The term impairment will be understood to mean an interference with functioning that results in behavior that is potentially harmful to self or others.

C. It is the intent of this policy to provide a mechanism to assist students who have developed a problem with substance abuse, and/or chemical dependence, as early as possible, preferably before significant impairment results, and before there is associated behavior that is potentially harmful to self or others, violates the regulations of the School of Medicine or The University of North Carolina at Chapel Hill, or the accepted standards of the medical profession.

D. This policy, as it relates to the fitness of a student, addresses only the personal and professional problems associated with substance abuse. The legal obligations of The University of North Carolina at Chapel Hill and the University of North Carolina Hospitals, regarding reporting of criminal activity and the responsibility to the public, are in no way altered by this policy.

E. Taken together with a commitment to the mission of the Medical School, this policy is an expression of humanitarian concern for the student who is impaired as a result of substance abuse.

F. This policy recognizes that alcoholism and drug abuse among students and physicians are too often ignored or untreated, in part because affected individuals and others often deny that there is a significant problem. The focus of this policy on impairment is therefore on substance abuse.

G. This policy recognizes that alcoholism and drug abuse are treatable conditions, and encourages all impaired students to seek help and cooperate in treatment at the earliest time in order to retain or regain full effectiveness.

H. This policy recognizes that constructive intervention by a helping group may be necessary when a student is impaired, or where there is a serious risk of impairment due to an already existing substance abuse and/or chemical dependence.

I. This policy is designed to assure that recovered students will be able to continue their medical education without stigma or penalty. Resumption of medical studies by a formerly impaired student will be dependent upon the successful completion of treatment, including participation in an appropriate program of aftercare and monitoring.

J. All University of North Carolina administrative and academic policies, including the Honor Code, remain applicable to impaired students.

K. These Guidelines and the accompanying Procedures are developed to provide guidance to members of a Committee on Impairment, to other school committees, and to individual members of the School's community, who may be confronted with the problem of a student who is impaired or at risk of impairment due to already existing substance abuse or chemical dependence, and who may desire to assist such a student.

L. This policy recognizes that students, as young professionals and future physicians, will be required at times to make painful, but morally correct decisions. The desire to identify and assist impaired colleagues is required by concern for their well-being and by concern about the harm impaired students may cause to patients, loved ones, and colleagues. The School recognizes that the AMA's "principles of medical ethics" commit physicians to identify colleagues who are not practicing medicine in a competent manner, and that these principles apply to everyone at the Medical School, including faculty and staff. This has special relevance for those on the faculty who have close associations with the students as mentors, friends, clinical preceptors, and advisors.

III. Procedures

The procedures noted below are intended to implement the School of Medicine's Guidelines on impairment of students due to the problem of substance abuse. A Committee will be responsible for implementation of the policy on impaired students. The membership of the Committee will include School of Medicine faculty who are broadly representative, who have links to treatment resources, and who have expertise in the evaluation and treatment of substance abuse disorders; the Committee will also include ten student representatives, two elected from each medical school class, who will be asked to serve on the Committee during their entire time in medical school, and two Medical Allied Health Students. The Committee will be co-chaired by a faculty member and one of the fourth year student representatives.

The functions of the Committee will be:

A. To answer questions about impairment, in general, and substance abuse, in particular.

B. To encourage all students who have a problem with substance abuse and/or chemical dependence to seek help at the earliest possible time.

C. To investigate and validate allegations of impairment, and to determine whether a student is impaired;
D. To directly intervene in instances where a medical student has been evaluated and judged to be impaired by substance abuse or to be at risk due to chemical dependence, and to recommend an individual program of treatment.
E. To assist in monitoring the student's progress during treatment.
F. To assist the recovered student in re-entering the medical school environment and in successfully resuming and completing his or her medical studies.
G. To explore and encourage the provision of adequate treatment resources.

Students who are seeking assistance, or a student, faculty member, or other individual who is concerned that a student may have a problem, may contact anyone on the Committee. Such reports will be held in strict confidence by the Committee, as will the name of the individual making the report, except in the instance where it is necessary for this information to be put forward in the course of due process, or when the Dean is notified of a problem in accordance with this policy. The student representatives on the Committee, along with the faculty co-chair, will conduct the initial investigation of the facts in order to determine the accuracy of the reported information and to acquire other relevant information as discreetly as possible. The faculty co-chair will notify the involved student at the outset that an allegation has been made, and that an investigation of the facts is to be initiated. The student will have an opportunity at this point to provide any explanatory information, to confirm or deny the existence of a problem, and to begin the process of evaluation and treatment. Others on the Committee will assist with the initial investigation as deemed necessary. Based on this review, a determination will be made as to whether a problem with substance abuse or chemical dependence exists, whether a student is impaired, and whether and what type of intervention is appropriate. In cases where there is some doubt, the Committee will meet to participate in the determination.

If intervention is determined to be necessary, a meeting with the student will be arranged to discuss the problem, with the goal of providing assistance to the student in recognizing the problem and in seeking treatment. Further medical and/or psychiatric evaluation of the student may be recommended. Students are expected to cooperate fully with the Committee. At this stage, the student will again have the opportunity, if desired, to respond to the determination.

The Committee will make recommendations for treatment or other appropriate disposition. The student will have the opportunity to participate in decisions about treatment. In this context, if the student has been determined to be impaired and treatment is recommended, he or she will be required to agree to the terms of treatment and monitoring acceptable to the Committee, as a condition of a leave or of remaining in school.

If the student refuses to acknowledge that an impairment exists, the student will have the opportunity to meet with and present evidence to the Committee. If the Committee then determines that the student is impaired but the student disagrees, or if he or she is not compliant with or unsuccessful in the recommended treatment program, the Associate Dean of Academic Affairs will be so informed by the Committee, and the matter will be presented to the established Student Promotions Committee for disposition.

If a student is considered by the Committee to be impaired, the Committee will determine whether the impairment is of such a nature that in order to adequately meet its responsibility to the patients and the public, the Dean or Associate Dean for Academic Affairs shall be informed of the impairment. The co-chairs of the Committee shall meet regularly with the Dean or the Associate Dean for Academic Affairs to review reporting requirements.

An impaired student who has agreed to participate in the recommended treatment program may be placed on an official leave of absence by the Student Health Service while the treatment is in progress. The usual duration of such leaves will be one academic year. The usual clearance from the Student Health Service, and approval by the Committee will be required before the student can return from leave status and proceed in school. If deemed necessary and appropriate, the leave of absence/treatment period may be extended for an additional time, up to the limits imposed by the school's existing two year maximum leave policy.

Monitoring and aftercare will continue as deemed appropriate after the student has completed initial treatment. Graduating students who are under treatment, including a program of aftercare and monitoring, will be transferred to the Committee on Physician Effectiveness and Well-being of the State Medical Society in the state where they will be doing their residency training.

All costs of treatment and testing measures are the responsibility of the student, although the Committee may be able to facilitate provision of treatment or assist in locating resources. Students are encouraged to have adequate health insurance.

The normative sanction in all instances of non-compliance with treatment recommendations will be dismissal from the School of Medicine. A similar sanction will be expected if the student drops out of the recommended treatment or fails to maintain fitness after he or she has been reinstated in the School of Medicine, although it is within the Committee's discretion to revise the recommendations. The final disposition of any case, such as dismissal, is a judgment which resides with the Dean of the School of Medicine. A student who is dismissed has access to the established appeal procedures of the School of Medicine (see policies *Student Promotions Committee Process* and *Appeal of a Student Promotions Committee Decision*).

Please see companion document entitled "Final Report, Plan for Implementation: Substance Abuse Policy for Medical Students".

15. GRADUATE STUDENT PARTICIPATION IN MEDICAL SCHOOL COURSES

Graduate students may participate in Medical School courses under the following conditions:

1) Only courses that are part of the first and second year curricula may be taken by graduate students. Such courses will be further limited to those courses approved by the Associate Dean of Academic Affairs and the Committee of Course Directors at the request of the Chairs of departments. Approved courses will be cross-listed with Graduate School.
2) Approved courses will be available on a space-available basis, with medical students having first priority. Available space will be determined by the Registrar of the School of Medicine and the Director of the Medical Sciences Teaching Labs at the beginning of each semester when the number of participating medical students is known.
3) Only University of North Carolina at Chapel Hill graduate students enrolled full-time in a degree program, or those who have been given permission by the instructor, will be eligible to participate.
4) Eligible students will be able to add approved courses only at the time of Drop-Add, which occurs at the beginning of the appropriate semester. Students must obtain written permission from the appropriate Department Chair and the Director of the Medical Sciences Teaching Labs (or their designates).
5) Participating students will be enrolled in the appropriate departmental cross-listed course(s) and be graded separately from medical students.

The reporting of grades will be the responsibility of the University Registrar, and the department or school in which the graduate student is enrolled.

6) Any departmental chair may request an exception to the policy for a course(s).
7) Participation in any laboratory or small group component of a course will be permitted at the discretion of the course director.

16. DELAY OF GRADUATION

The Student Promotions Committee is charged with making all decisions in matters of promotion and graduation, and has the authority to grant permission for a student to voluntarily postpone graduation for the purpose of taking additional elective courses, if in the opinion of the Student Promotions Committee the reasons are valid and the student's plan is appropriate.

I. Initiation of a Request

A student may initiate a request to the Student Promotions Committee by:

A. Presenting the Associate or Assistant Dean for Academic Affairs with a written request stating the rationale and detailing the proposed course schedule, calendar and anticipated date of graduation.
B. Providing the Associate or Assistant Dean for Academic Affairs with a written statement from his/her class advisor concerning need, and a written statement from his/her electives advisor on the proposed course selections and calendar.
C. The student may request a personal appearance before the Student Promotions Committee to present his/her petition.

II. Review by the Student Promotions Committee

The Associate Dean for Academic Affairs will present the request and supporting statements to the Student Promotions Committee, which will review all pertinent available information on the student and the proposal with the class advisor present.

If the Student Promotions Committee sees fit to deny the student's request, the usual levels of appeal of the Student Promotions Committee decisions are available to the student (see policy *Appeal of a Student Promotions Committee Decision*).

III. Guidelines

If the Student Promotions Committee grants the request, the student will be informed of, and agree to the following stipulations:

A. The student will be administratively continued as a senior student beyond the original expected graduation date.
B. The student will be officially registered and will be charged tuition and fees for all courses taken beyond the original expected graduation date, not to exceed the annual tuition rate.
C. The usual performance standards will apply, and all grades and evaluations awarded will become a part of the official record.
D. The Student Promotions Committee will consider all course grades and evaluations in reaching its ultimate decision concerning graduation and the awarding of the M.D. degree (see policies *Student Promotions Committee Process*, *Student Evaluation — the Preclinical Years* and *Student Evaluation — the Clinical Years*).

E. The Student Promotions Committee has the option of not considering these "additional electives" in their awarding of final grade of "Honors for the Year."
F. The Dean's Office letter of recommendation will include the additional course(s) taken.
G. All course approval and advising will follow the regular pattern established for fourth year students. The student cannot be given special priority over other fourth year students in the choice of courses or scheduling sequences.
H. The student will be ineligible for financial aid unless aid comes from sources that do not limit aid for other students; however, the usual considerations given to fourth year students for insurance, etc. will apply.
I. The student has the responsibility for notifying and making the appropriate arrangements with the NRMP.
J. The privilege of delaying graduation will not be extended for more than one academic year beyond the originally expected date of graduation.

17. LEAVE OF ABSENCE

I. Definition

A leave of absence is defined as any interruption in the regular enrollment of a student in the University of North Carolina School of Medicine curriculum. Regular enrollment is primarily defined as full-time enrollment in four consecutive years of the medical curriculum, including scheduled free time. However, regular full-time enrollment may be extended beyond the four consecutive years of medical school (i.e., decelerated curriculum), and may be less than full time, as specified by the policies of the University of North Carolina at Chapel Hill. Students pursuing full-time research may enroll for MEDI 399 Research, if they wish to retain student status. Students taking a medical leave must be withdrawn by the Student Health Service, and at the option of the Student Health Service may or may not be required to obtain clearance to re-enroll.

II. General Guidelines

A. ***Time Restrictions***
The maximum leave permitted from the medical curriculum at one time is two consecutive years. With prior approval, leave may be extended for three consecutive years for medical students enrolled in combined degree programs. Extension beyond three years is discouraged and requires the permission of the Dean on an individual basis. Students other than those in combined degree programs, who wish to return after leave of more than two consecutive years, must apply to the Admissions Office for readmission. If readmitted, the Admissions Committee will determine, after consultation with the appropriate faculty and administrators, the level at which a student would reenter.

B. ***Request for LOA***
Except for emergency personal and medical leaves, students are encouraged to submit their requests for leave at the earliest possible time. When plans for research, Graduate School, etc. are indefinite, the request should be submitted subject to acceptance by the program.

C. ***Consultation with Administrative***
Any student who obtains a leave, for whatever reason during the academic year, must consult with both the Assistant Dean for Academic Affairs and the Assistant Dean for Student Affairs.

D. ***Restrictions During Exams:*** No leave may begin during any examination period; the student should request a medical or administrative excuse from the examination(s).

E. ***Joint Degree***: Students who intend to pursue a joint degree will be assigned to a special electives advisor. The advisor will determine which courses will carry joint credit in the medical school. In the first week of each semester, the student taking courses for medical school credit, must submit the appropriate drop-add forms documenting advisor approval.

F. ***Research***: Students going on leave for full-time research may enroll for MEDI 399 Research for zero credit, in order to retain student status. The reasons for retaining student status are: Student Health Service privileges, including group medical insurance; University housing opportunities; library and recreational facilities; and deferment of repayment of student loans. Tuition and fees are charged. Students may choose the terms for which they wish to be enrolled and should indicate those on the leave form.

G. ***Leave During the Clinical Years***

Generally, leaves of absence should occur between academic years. Students commencing third year clerkships should plan to complete them within one academic year, except for reasons of health or emergency. Students who take electives after completion of third year clerkships should plan to graduate within one year. Students who do not complete all of the required clerkships and electives before graduation are subject to the policy of Delay of Graduation.

1. Delay of Clerkship: In the third year, a student may request to delay a clerkship without taking a leave of absence, but withdrawal from academic work for more than six weeks is considered a leave of absence and is subject to all regulations noted within.
2. Interruption of a Clerkship or Elective: Subject to the discretion of the department, a student who interrupts a scheduled clerkship or elective may be required to reschedule and complete the entire course in order to receive credit.
3. Fourth Year: In the fourth year, normal progression is possible without enrollment in all three terms. A student opting such an elective schedule is not required to obtain permission for a leave of absence, but is required to provide written notice of intent not to enroll in a given term.

H. ***Mailing Address***: While on leave, students must keep their mailing addresses current by notifying the School of Medicine Registrar.

I. ***Financial Assistance***: All students who receive financial assistance and are considering a leave of absence should be aware of the implications for non-enrollment or taking coursework below the half-time status. Financial assistance reflects actual enrollment hours and expenses will be prorated.

Students who fall below the half-time status or who take a leave of absence, will accelerate their grace period and eventual loan repayments. Listed below are examples of grace periods and repayment dates.

University Loans National Direct Student Loan	Six month grace period then repayment of principal and interest until full-time status is regained.
Health Professions Student Loan	One year grace period then repayment of principal and interest until full-time status is regained.

Guaranteed Student Loan	For students who have loans at 8 or 9% there is a six month grace period. For students who have loans at 7% there is a nine month grace period.
Health, Science & Math Program	Each case will be reviewed independently.

J. ***Conditions of Return***

1. *Academic Conditions:* In some cases, the Student Promotions Committee may require a student to take a leave of absence, and may impose conditions upon the student's return, i.e., a student may be required to stand reexamination prior to re-enrollment (see policy Student Promotions Committee Process).
2. *Limitations of Space:* Continuing students will have priority over students returning from personal leave, both for seating space in the teaching laboratories and in clerkship assignments. Because of the time restrictions of remedial programs and Student Promotions Committee actions, advance notice about space availability may not be possible. It is possible that a student would not be allowed to re-enroll when planned, if space is not available.

III. Initiating a Leave of Absence

Any leave of absence must be approved by the Assistant Dean for Academic Affairs and the Assistant Dean for Student Affairs. The Assistant Deans will approve or disapprove requests based on the personal needs of the student, the implications for scheduling, size of classes, curriculum changes, and value to the student's education. Before reaching a decision, the Assistant Deans may consult with class advisor, the Registrar or Assistant Registrar, and others as appropriate.

Students must obtain a copy of the *Leave of Absence* policy and the appropriate Leave of Absence Request from the School of Medicine Registrar. The following guidelines should be observed in processing leaves of absence.

A. *Medical Leave*

1. Students should consult with their class advisor.
2. Students must submit the completed Leave of Absence Request, with the appropriate signatures, and/or letters according to directions on the form, to the School of Medicine Registrar.
3. Students must consult with a physician at the Student Health Service and obtain an official medical withdrawal.
4. Students may schedule an appointment with the Assistant Dean for Student Affairs and/or the Assistant Dean for Academic Affairs to discuss the consequences of leave upon scheduling, financial aid, grades, letters of recommendation, residency applications, etc.

B. *Research Leave*

1. Students should consult with their class advisor.
2. Students must submit the completed Leave of Absence Request, with the appropriate signatures, and/or letters according to directions on the form, to the School of Medicine Registrar.
3. Students may schedule an appointment with the Assistant Dean for Student Affairs and/or the Assistant Dean for Academic Affairs to discuss the consequences of leave upon scheduling, financial aid, grades, letters of recommendation, residency applications, etc.

C. *Graduate Student Leave*

1. Students should consult with their class advisor.
2. Students must submit the completed Leave of Absence Request, with the appropriate signatures, and/or letters according to directions on the form, to the School of Medicine Registrar.
3. Students should refer to the special periodic requirements for a Joint Degree (see policy *Leave of Absence, Section II, 9*).
4. Students must meet with the School of Medicine Registrar, or Assistant Registrar, to initiate an Intra University of North Carolina Change Form to change schools.
5. Students may schedule an appointment with the Assistant Dean for Student Affairs and/or the Assistant Dean for Academic Affairs to discuss the consequences of leave upon scheduling, financial aid, grades, letters of recommendation, residency applications, etc.

D. *Personal Leave*

1. Students should consult with their class advisor.
2. Students must submit the completed Leave of Absence Request, with the appropriate signatures, and/or letters according to directions on the form, to the School of Medicine Registrar.
3. Requests for Personal Leave are subject to the approval of the Assistant Dean for Student Affairs and the Assistant Dean for Academic Affairs.
4. Students must schedule an appointment with the Assistant Dean for Student Affairs and/or the Assistant Dean for Academic Affairs to discuss the consequences of leave upon scheduling, financial aid, grades, letters of recommendation, residency applications, etc.

IV. Check-out Procedures

The University of North Carolina at Chapel Hill requires that students check out with the appropriate University offices if leave begins after the first day of a semester or summer term. Upon notice from the Assistant Dean for Student Affairs and the Assistant Dean for Academic Affairs that a request for leave has been approved, the student should: obtain a copy of the official University Withdrawal Form from the School of Medicine Registrar; check out as directed; and return the form with the registration card and athletic pass to the School of Medicine Registrar.

V. Return from Leave of Absence

A. ***Letter of Intent to Return***

The student must confirm his or her intent to return to school, by submitting a letter to the Assistant Dean for Student Affairs, by the appropriate deadline as shown below:

TERM	DEADLINE
Fall	May 1
Spring	November 1
Summer	February 1

The student will be notified about space availability. If re-enrollment is approved, s/he will be sent the required forms.

B. ***Return from LOA at Earlier Date***

A student who wishes to return from a leave of absence earlier than planned, or wishes to extend a leave, should make an appointment with the School of Medicine Registrar to discuss issues of scheduling and availability of space.

C. ***Curriculum Changes***
The student should inquire at the Office of Academic Affairs about curriculum changes that may have occurred during the leave, and should seek counseling about his or her individual circumstances well in advance of the expected date of return.

D. ***Outstanding Bills***
Students must pay all bills owed to the University prior to registration.

E. ***Special Requirements***

1. *First or Second Year Students:* If a student is returning to the first or second year class, s/he must confer with the Medical Sciences Teaching Labs about the availability of laboratory and desk space.
2. *Third or Fourth Year Students:* If a student is returning to the third or fourth year class, s/he must confer with the School of Medicine Assistant Registrar about scheduling options and requirements.
3. *Return from Graduate Studies:* If a student is returning from a Graduate School Leave, s/he must initiate an Intra University of North Carolina Change Form with the Graduate School.

F. ***Submission of the Return From Leave of Absence Forms***
The student must submit the required Return From Leave of Absence Forms, the Data Processing Form, and any additional forms or letters noted below, to the School of Medicine Registrar.

1. *Medical LOA:* Students must obtain clearance from the Student Health Service, as required by a medical leave of absence (see policy Leave of Absence, Section III, A).
2. *North Carolina Residency Status:* Students who are absent more than one semester, and are claiming North Carolina Residency Status, must submit a new North Carolina Residency Status Form to the Office of Admissions of the Medical School, so that a determination of North Carolina Residency Status for the purposes of tuition payment may be made.
3. *Medical History Form:* Students who are absent for two academic years, must obtain and submit a Medical History Form to the Student Health Service.

Office of Academic Affairs
School of Medicine
CB# 7000, 137 MacNider Building
The University of North Carolina at Chapel Hill
Chapel Hill, N.C. 27599-7000

Bound Printed Matter
Bulk Rate
U.S. Postage
PAID
Permit No. 177
Chapel Hill, NC 27599-1110

The University of North Carolina at Chapel Hill